



INTERNAL AUDIT HANDBOOK

VOLUME II

INTERNAL AUDIT CONCEPTS
AND PRACTICES

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Prepared on behalf of

Treasury Board of Canada
Comptroller General
Interdepartmental Advisory Committee
on Internal Audit

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FOREWORD

This Handbook consists of three volumes of which this is Volume II. The organization of the Handbook segregates three major aspects of internal auditing. Volume I addresses the establishment and development of an effective internal audit function. Volume II provides guidance on implementing internal audit concepts and practices generic to any audit. Volume III is reserved for Internal Audit Guides providing guidance on the audit of specific activities. The first two volumes have been published separately. Volume III will be published in the form of individual Guides, as they become available.

Volume I provides guidance on the development, approval and promulgation of an internal audit policy, on the objectives, responsibilities and composition of an internal audit committee, on identifying the audit universe and developing the long-term plan and annual schedule of internal audits, and on the management of an internal audit function. Volume II builds on the base provided by Volume I and provides guidance on planning and conducting each individual audit assignment including various concepts and approaches to be considered and utilized.

The two-part presentation of Volume II is designed to segregate the discussion of the internal audit process (Part 1) and discussion of general internal audit concepts and approaches (Part 2), the latter of which is largely independent of the audit process.

Part I consists of individual chapters covering each of the key elements of the Internal Audit Assignment Process, namely Assignment Planning, Review, Evaluation, Verification and Reporting. It includes appendices covering the special topics of risk analysis in assignment planning, an illustration of an indexing/cross-referencing system for working papers and one on controls testing verification programs for essential controls.

Part 2, Internal Audit Concepts and Approaches, covers a broad spectrum of generic internal audit concepts, methods and techniques. It includes Internal Audit Approaches: Objectives and Lines of Inquiry; Control: Concepts and Applications for Internal Auditors; Management Control: Concepts and Practices; Analysis Concepts and Practices for Internal Auditing; Audit Evidence; Auditor Judgment; Auditor-Auditee Relations; Communication Concepts for Internal Auditors; and Auditor Reliance.

The list of subjects discussed in this volume does not attempt to cover all relevant internal audit concepts, methods and techniques, nor does it give all topics equal depth of coverage. This is by design. It is not our intention to duplicate existing audit literature where it is considered sufficient, but rather to supplement what exists in readily available form.

In particular, statistical methods for auditors is well covered in text books and, therefore, is simply referred to in bibliographic terms in Chapter 4, Analysis Concepts and Practices for Internal Auditing.

On the other hand, the topic of Computer Aided Audit Techniques (CAAT) is introduced in Chapter 6, Auditor Judgment, but not covered in great detail simply because the topic is too volatile at this point to capture in definitive terms.

It is expected that, as internal audit concepts, methods and techniques evolve, some chapters will be added, (e.g. one on CAAT) and others will be revised.

It may have occurred to some readers that there is a glaring oversight in this volume in that there is no chapter on EDP auditing. Again this is by design. The contention embodied in this volume is that all concepts, methods and techniques covered here are totally generic and, therefore, as applicable to EDP auditing as to any other "technical" area, (e.g. personnel auditing, auditing of records management, or auditing of line organizations, such as ocean sciences, environmental protection, health protection, etc.). Therefore, EDP auditing, like audits of other specialized areas, should be covered in Guides which will form part of Volume III.

Acknowledgements

This volume of the Handbook is the product of numerous authors and even more numerous reviewers. Their contributions are gratefully acknowledged. We hope that each and every participant has gained from the experience and feels part of the accomplishment.

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1 Standards for Internal Audit in the Government of Canada. Treasury Board of Canada (Office of the Comptroller General), 1982.

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VOLUME III INTERNAL AUDIT GUIDES
(Reserved for Future Guides - These will
be released individually as completed)

PART ONE: THE INTERNAL AUDIT ASSIGNMENT PROCESS

INTRODUCTION

Purpose

The purpose of Part 1 of the Internal Audit Handbook is to provide a framework for developing and conducting a typical audit assignment. It will assist the internal auditor in recognizing key elements of the process, their purpose and what techniques may be employed to successfully execute them.

A pictorial overview of the relationship between the internal audit process and related issues is provided in Figure 1. Part 1 also attempts to demonstrate the nature of the process and the linkages between its principal elements. The concepts underlying the process and appropriate associated techniques are covered in Part 2 of Volume II of the Handbook.

The audit assignment process described here emphasizes planning and execution of review, evaluation and verification activities. These activities are aimed at determining if controls created by departmental or agency managers ensure the efficiency, economy and effectiveness of their processes and results. This is accomplished, in essence, by developing a predetermined control model, or modifying an existing one, in consultation with the auditee, and then assessing the auditee's actual control framework against the agreed-upon predetermined control model.

Since the description of the audit assignment process presented here is necessarily general in nature, it cannot take into account all the specific or unique characteristics of different entities being audited. It does, however, provide a framework which should help to add a consistency and thoroughness of approach to the audit assignment process.

The application of sound judgment and professionalism will continue to remain important ingredients for quality results.

THE INTERNAL AUDIT PROCESS

(Relationship with Internal Audit Philosophy,
Standards, Concepts, Methods and Techniques)

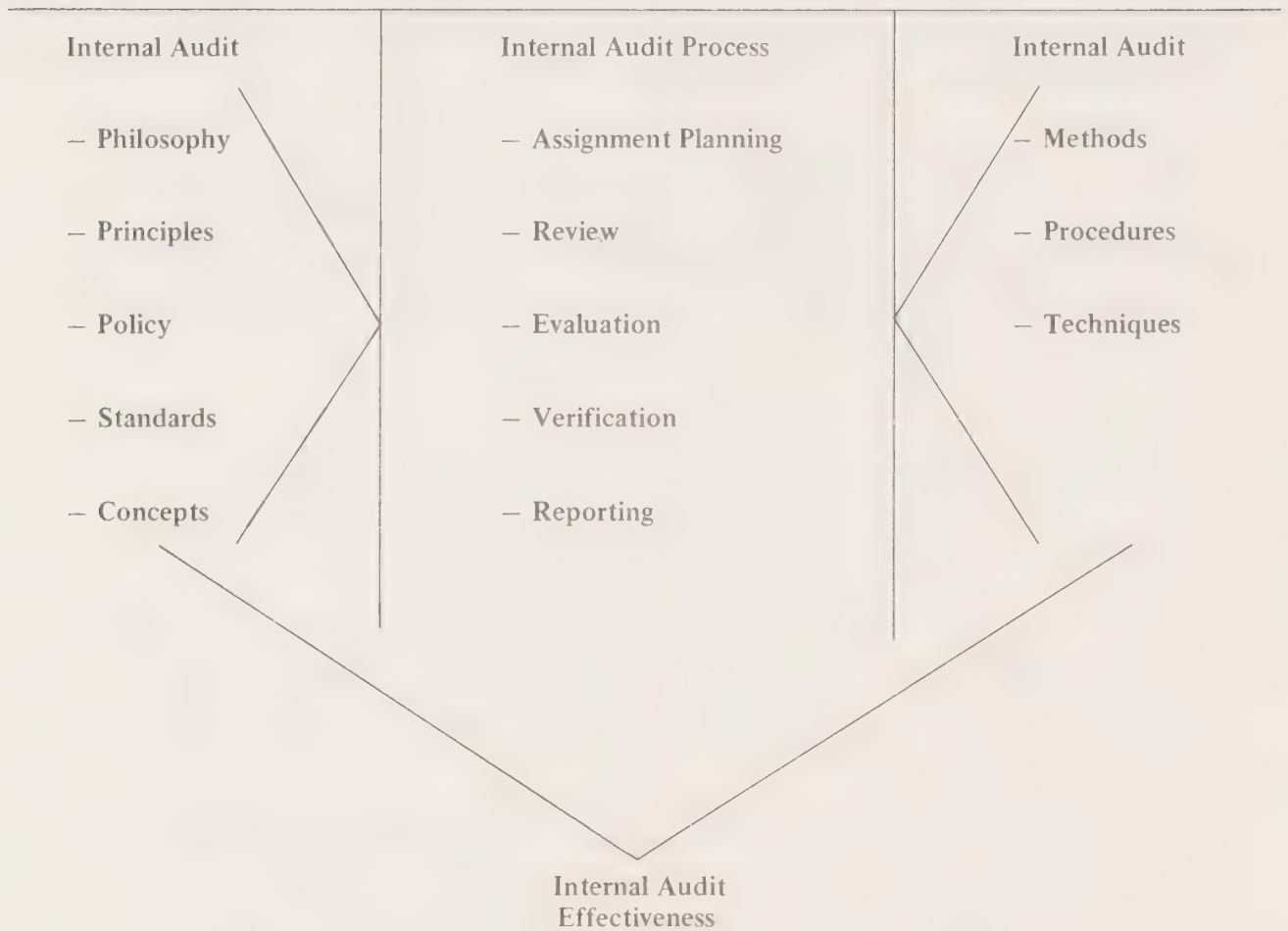


Figure 1

The Internal Audit Assignment Process

The internal audit assignment process involves a combination of sequential and iterative (i.e. looping back to previous steps) activities based on the following fundamental elements: planning the audit assignment, planning audit steps or programs (related groups of steps), gathering relevant data, deciding when data qualifies as audit evidence, analysis of evidence, verification of evidence, deciding on findings and conclusions and developing recommendations.

For purposes of discussion, these fundamental elements are grouped into the following audit assignment phases: assignment planning, review, evaluation, verification and reporting.

The audit assignment process necessitates on-going, continuous collaboration and communication between the auditor and the auditee if it is to be successful. Internal Audit is an advisory (staff) function. The internal auditor has no power to direct auditees, therefore, cultivation of good rapport is essential to an effective audit process. (Refer to Volume II, Part 2, Chapter 7, "Auditor - Auditee Relations" for an elaboration.)

Assuming regular dialogue between auditor and auditee occurs, there should be no surprises either during the process or at the assignment's completion.

The audit assignment process also requires reassessment at each stage in that each step should build upon or modify previous efforts to ensure that the audit process focuses on areas of greatest concern and does not pursue lines of inquiry that are not likely to be cost-effective.

What Part 1 attempts to do is to guide the auditor through this process by focusing on the principal elements and their relationships. It highlights the key tasks to be undertaken, indicates where further planning or reassessment may be required and links the iterative and sequential steps into an integrated process.

It should be noted that while Part 1 walks through each of the five principal audit phases in the process, it is not so rigid that it requires each and every step to be done for every potential finding. For example, not all evidence requires verification, not all potential findings are reported, etc. Also, as already indicated, not all phases follow each other in a strictly sequential manner. For example, while an evaluation phase exists, it does not mean that evaluation occurs only at a specific point in time in the process. Evaluation is a continuous appraisal process. It overlaps all the other phases of the audit. The dynamics of the audit assignment process are illustrated in Figure 2.

Figure 3 outlines the audit process as described in Part 1 and can be used as a reference to ensure that each of the critical steps of an assignment is addressed.

DYNAMICS OF THE AUDIT ASSIGNMENT PROCESS

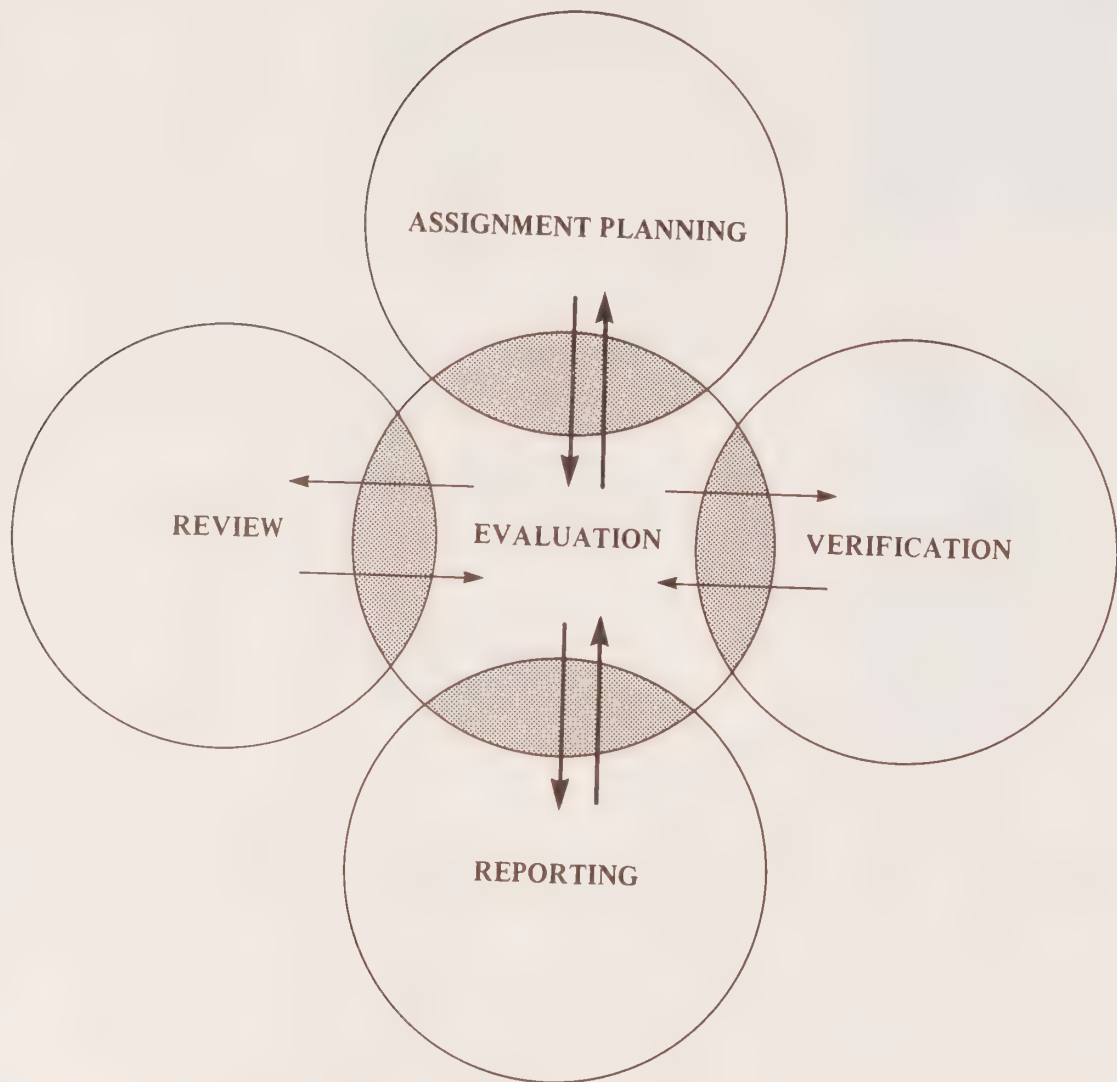


Figure 2

THE INTERNAL AUDIT ASSIGNMENT PROCESS

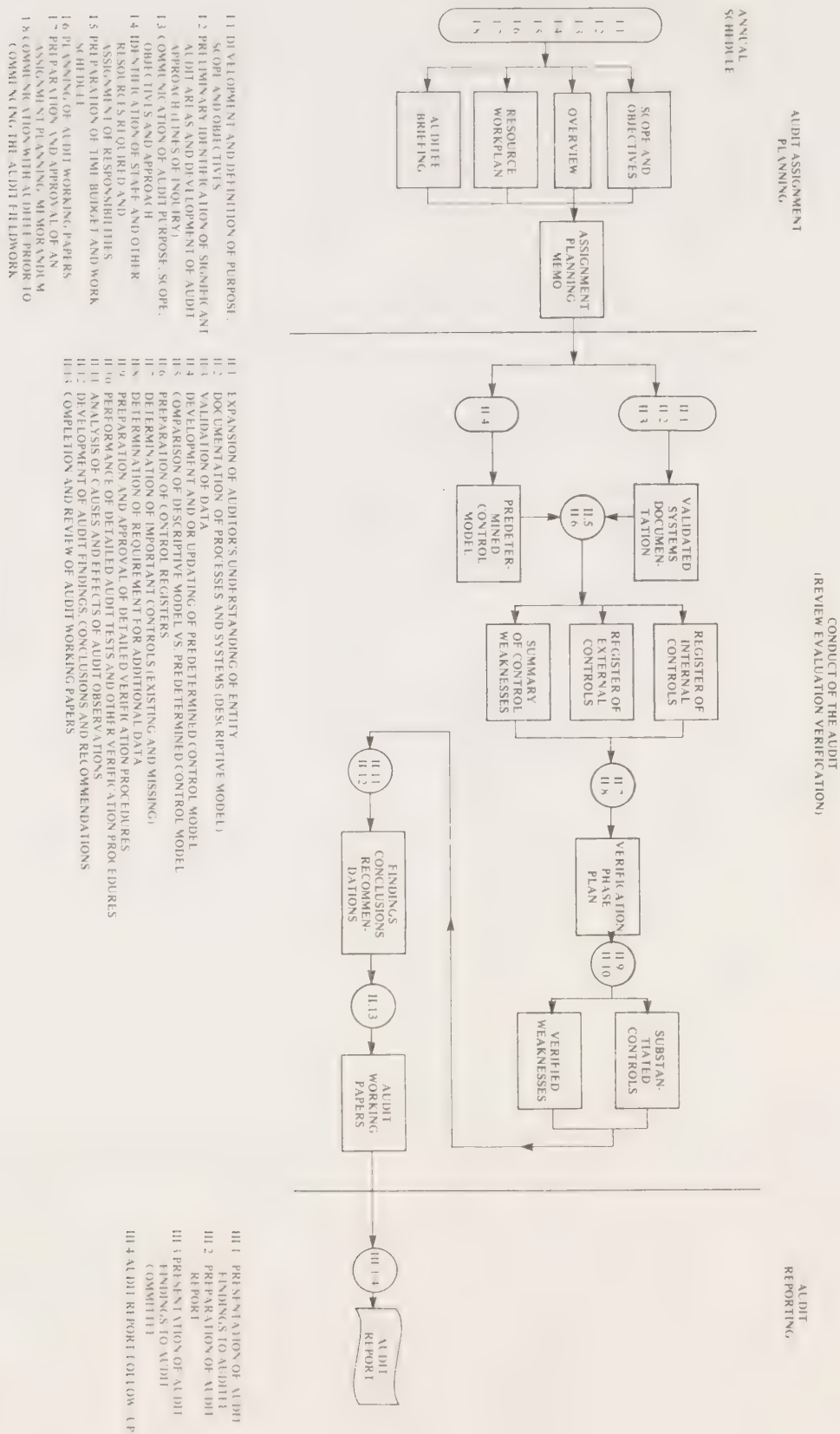


Figure 3

CHAPTER ONE

ASSIGNMENT PLANNING PHASE

INTRODUCTION

It is the responsibility of the director of internal audit to direct the preparation of the long-term and annual plans for the internal audit unit. The plans will include a broad definition of purpose, scope and objectives for each assignment, together with a forecast of the time and resources required to complete the assignment and the expected timing of the planned audits. The audit managers or team leaders in charge of audits or specific audits respectively are then responsible for translating the broad purpose, scope and objectives statements into action plans tailored to each audit assignment.

Assignment planning is a progressive process which takes place throughout the entire audit. It must therefore be recognized that although the major assignment planning effort occurs at the beginning of the process, it is expected that the plan will be "fine tuned" during subsequent phases of the assignment. The extent of fine tuning will, of course, diminish as the auditors learn more about the nature and state of the auditee environment.

We will now proceed to describe that phase of the audit process which is called assignment planning. It is a derivative of long-term and annual planning (discussed at length in Volume I, Chapter 3) and a prerequisite to the conduct of the audit of a specific audit assignment. It starts with familiarization with the audit entity and culminates in a detailed audit planning memorandum.

SECTION ONE: PRINCIPAL COMPONENTS

The principal components of the assignment planning phase are:

- development and definition of purpose, scope and objectives (I.1)¹;
- preliminary identification of significant audit areas and development of audit approach (i.e. Lines of Inquiry) (I.2);
- communication of audit purpose, scope, objectives and approach (I.3);
- identification of staff and other resources required, and assignment of responsibilities (I.4);
- preparation of time budget and work schedule (i.e. a project plan) (I.5);
- planning of audit working papers (I.6);
- preparation and approval of an assignment planning memorandum (I.7);
and
- communication with auditee prior to commencing the audit fieldwork (I.8).

¹ The numbers in parentheses refer to the components of the audit process as shown in Figure 3.

Development and Definition of Audit Purpose, Scope and Objectives

Since the annual audit plan outlines only the broad purpose, scope and objectives of each audit assignment, the team leader must establish, early in the planning phase, a more specific definition of the purpose and scope of the assignment and more precise audit objectives. The usual principal purpose of any audit is to determine the extent to which essential control objectives are met by the audited organization. To establish a meaningful specific audit purpose, scope and objectives, the team leader requires the following:

- information on/or a decision on the type of audit planned;
- a good knowledge of the audit entity's administrative infrastructure;
- a good knowledge of the delivery systems of audit entity's operations or activities;
- a good knowledge of the audit entity's long-range and current plans;
- a predetermined control model for the audit entity;
- knowledge of the audit entity's current risk exposures;
- knowledge of other planned audit and quasi-audit activities in the same area and timeframe; and
- sources of acceptable audit criteria to be applied.

It may be seen from the foregoing that the team leader, in formulating the purpose, scope and objectives, must develop a good working knowledge and understanding of the audit entity and then, using that knowledge, develop the specific requirements of the particular audit being considered.

In developing an understanding of the audit entity it is not likely that the team leader can gain an intimate understanding of all its activities at this early stage of the assignment (this is particularly true if it is the first audit of that unit). Rather, an overall appreciation of the nature, characteristics and boundaries of the audit entity is all that is expected. To obtain such an appreciation, the team leader will perform, as a minimum, the following tasks:

- identify and examine the entity's mandate and related authorities;
- identify and examine significant legal, financial and regulatory constraints including, as sources, such documents as the Main Estimates, legislation, regulations and central agency policies;
- examine corporate objectives, plans, policies and directives;
- develop an understanding of the corporate structure and activities by examining corporate organization charts, position descriptions and relevant in-house correspondence and documentation;
- identify associated priorities and problems through reference to available accountability models and systems descriptions, previous internal audit files and reports, central agency evaluation reports and internal program review and evaluation reports; and
- review significant financial and other operating data including long-term and annual budgets and related variance reports, management reports, person-year allocations, performance measurement reports and transaction volumes, where available.

The general purpose of the audit is derived from standard No. 1² which reads: "Departments shall have an independent internal audit function that carries out a systematic review and appraisal of all departmental operations for purposes of advising management as to the efficiency, economy and effectiveness of internal

2 Standards for Internal Audit in the Government of Canada, 1982.

management policies, practices and controls." The wording is adjusted, however, to suit the audit unit. On the other hand, the detailed purpose and scope of the audit assignment is largely determined by the type of audit undertaken.

As indicated in the foregoing, it is important to identify clearly the type of audit since this will significantly affect the definition of audit purpose, scope, objectives and lines of inquiry.³ The principal types of audit are:

Responsibility Centre Audit

- (a) Purpose: A responsibility centre (RC) audit is undertaken for the purpose of providing managers with advice on all the important operations and activities undertaken by that RC (whether program or administrative), the management of that RC, and the impact of functional direction (program and administrative) on the activities of that RC.
- (b) Scope: The scope of an RC audit is determined solely by the organizational boundaries of the RC itself.

Organizational Audit

- (a) Purpose: This is an audit which provides management with advice on an organizational unit of one or more RCs or parts of RCs.
- (b) Scope: The scope is determined by the combined boundaries of the RCs, or parts of the RCs, included in the audit unit.

Function Audit

- (a) Purpose: This is an audit which provides advice to management on an organizational unit which provides functional direction to other organizational units and includes both program and support (e.g. finance, administration, personnel, official languages) functional activities. This functional direction will usually be

3 The objectives and lines of inquiry, for each general type of audit outlined here, will be discussed in more detail in Volume II, Part 2, Chapter 1, "Internal Audit Approaches: Objectives and Lines of Inquiry".

provided through the issuance of formal policies and directives. Typically, an audit of the effectiveness of adherence to such directives will form one component of a function audit.

(b) **Scope:** Functional audits are usually performed on two levels:

- audit of the organizational unit which is the source of functional direction;
and
- audit of adherence to policy and directives in all or a sample of the organizational units which are subjected to functional direction, and the effect of the policy and directives on those units.

Program Audits

A program audit is a responsibility centre audit of the RC, or RCs, charged with the overall responsibility for the program or activity (e.g. a branch) and, where applicable, all or a sample of the program-related operations of the responsibility centres (e.g. regions, field offices) involved in the delivery of the program.

Systems Audits

Although the term "systems audit", if one were to take the most generic definition of the word "system", would include all types of audit unit described above, the term as used here is meant to include only systems in the narrower sense as used by EDP or systems and procedures staff.

(a) **Purpose:** A systems audit is an audit which provides management with advice on a system used by any functional or line unit, or any combination of the two.

(b) **Scope:** This type of audit is similar in nature to the functional audit in that it is carried out by performing:

- a review of the organizational unit which is responsible for the overall design, development and maintenance of the system (the administering unit, typically the EDP group);

- a review of the organizational units which host (own) and use the system (i.e. have input and output interface with the system); and
- a review of a sample of the users of the system.

Pre-implementation Audit

- (a) Purpose: This is an audit of major systems under development, including legislation, policies and procedures, information systems, program delivery systems, contracts, etc., prior to their implementation.
- (b) Scope: This type of audit may consist of one or both of the following: a relatively limited-scoped audit, principally, with the auditability and adequacy of controls built into the systems to be implemented; and an audit that may include in its scope an assessment of the systems development process itself.

Special Audit

- (a) Purpose: The special audit is usually performed at the request of management, normally to deal with unforeseen situations, policy developments or other senior management concerns, including suspected fraud or defalcation.
- (b) Scope: The special audit is narrow in scope and will usually be executed in a comparatively short time frame.

A review of related previous, concurrent or planned audits (internal, external, other), program evaluation and other similar control-oriented assignments provides a basis for determining the extent of any likely overlap with the current internal audit assignment. Previous, concurrent or planned audit activities may significantly alter the scope of the present assignment or the required depth of coverage. For example, the audit of a particular function may be split into several components such as:

- a review of process controls within the function;

- a review of management controls within the relevant responsibility centre;
- a review to ensure compliance of other responsibility centres with functional direction provided by a functional responsibility centre in order to assess its effect on the organization.

In these situations, separate audit teams may be assigned to examine each component. Clearly there will be a necessity for careful planning to consider the extent to which resources may be utilized to achieve objectives common to more than one component.

For most types of audit (excluding special audits) the audit objective is to provide management with assurance that information it is receiving as to the state or performance of the audit entity under review is according to management's expectations. This requirement is reflected in the predetermined control model.

This assurance is provided in terms of two broad and inclusive categories of performance objectives:

- (1) that predetermined results are being achieved (economy, efficiency and effectiveness); and
- (2) that prescribed infrastructure (e.g. delivery systems/administrative systems/organization structures) is performing as intended.

The need for the first objective is fundamental; the second is subsidiary to the first, in that not only do you want to know that objectives are being met now, but that they will continue to be met.

In addition to performance objectives, the predetermined control model will reflect required physical controls, to the degree that they are specified by higher authority.

Finally, to enable the auditor to judge whether or not objectives are being met, the model provides criteria. Since the level at which criteria are defined must correspond to the level of their corresponding objectives, little detail can be provided at this time aside from asserting that they exist explicitly to the degree that required infrastructure and results are pre-defined. Therefore, it is not until we contend with a specific audit entity, with specific, prescribed infrastructure and pre-defined results, that detailed criteria can be defined. The foregoing presupposes that the audit assignment planner is starting out with a predetermined control model already available. Where it is not, it will have to be developed.⁴

Performance criteria for control evaluation are required at two levels: (1) for compliance review, we need criteria for recognizing that a required control exists (including all its required elements); and (2) for substantive testing, we need criteria for determining if the control is effective.⁵

Sources of performance criteria include:

- audit guides developed under the auspices of the Interdepartmental Advisory Committee on Internal Audit;
- criteria developed for other similar audits;
- central agency policy groups or their output;
- comprehensive auditing criteria for departments and central agencies developed by the Auditor General of Canada;

⁴ The ideal situation is where a predetermined control model has been developed, jointly with management, in a time frame which is totally independent and preceding the audit assignment time frame. If a predetermined control model is not already available, the second preferred process is one where the model is developed during the review process, concurrently with review and documentation of existing systems, etc., but by an independent team which includes management representation. It is recognized, however, that for pragmatic reasons the preferred approach will not always be possible to implement in actual practice. See Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors" for a further discussion of the predetermined control model.

⁵ See Volume II, Part 2, Chapter 2.

- pronouncements of professional organizations;
- literature on the subject under examination written by qualified professionals;
- input from specialists active in the area; and
- management's own performance criteria.

The updating (development, if not already available) of acceptable objectives or criteria is an integral part of the development and maintenance of a predetermined control model. This activity is performed mainly in the review phase; the results will form the basis for audit activities to follow. It is, therefore, essential that sources of criteria be identified as early as possible in the audit assignment and that agreement be reached with auditee management on the acceptability of the identified sources. This will assist the team leader in planning for the review phase and it should reduce the potential for disagreement with the auditee about audit findings.

The starting point for an assignment is normally the broad general statement of purpose, scope and objectives contained in the annual plan. In the steps outlined in Part I, the team leader will develop and modify those general statements to suit the particular circumstances of the entity under examination. Therefore, it is essential for the team leader, once the specific audit purpose, scope and objectives have been developed, to reconcile them to the requirements of the annual plan.

In many instances this will involve simply a direct comparison to ensure that they reflect the intentions in the overall plan. However, in a number of cases the team leader may discover in the course of assignment planning that the terms of reference originally envisaged are either inadequate or inappropriate to the circumstances of the audit entity. The team leader may conclude, for example, that the scope requires significant expansion, amendment or indeed that the assignment is unjustified in its present form. Consideration of these matters should be documented by the team leader together with decisions taken and the assumptions underlying such decisions.

In the worst case this may result in the audit manager or director having to adjust the annual, or even long-term, audit plan.

Preliminary Identification of Significant Audit Areas and Development of Audit Approach

To identify significant areas for examination the team leader must become familiar with all major operations of the entity and with their respective risk potential.

This process will normally incorporate some or all of the following:

- describing in outline form the program delivery system along with its expected results;
- identifying the controls in place to measure and report on the performance of the program delivery system;
- identifying the controls in place to measure and report on the economy, efficiency and effectiveness of the program or activity;
- describing in outline form the administrative support systems along with their expected outputs;
- identifying the controls in place to measure and report on the performance of the administrative support systems; and
- identifying the controls in place to measure and report on the economy, efficiency and effectiveness of administrative support.

These include:

- identifying the nature and extent of EDP systems;
- identifying mechanisms for the protection of assets;

- producing overviews of the key management functions and their inter-relationship; and
- outlining the management of financial, human, physical and information resources.

The information gained will provide broad insight into the nature and state of the audit entity. The specific activities to be given the most attention in the audit must then be identified. These will be determined in terms of the following factors:

- materiality
- management concerns
- inherent risk
- control risk (relative risk)
- risk potential (risk of loss or opportunity cost potential)
- weaknesses identified by previous audits or program reviews
- cost-benefit implications.

The Concept of Risk - Its Dimensions

To make decisions on which auditee areas should be given the most attention it will be necessary for the auditor to assess the risk of not giving it attention; i.e. assess the area's risk potential. In managers' terms - What are the repercussions of being out of control in a specific area or activity for which the auditee is responsible?

The foregoing "factors" are all components of the risk assessment process. In what follows, the relative contribution of those factors, to the assessment of risk potential, will be discussed and an illustration will be provided of the use of risk potential in deciding on how to allocate available resources to auditee areas of responsibility.

In Volume II, Part 2, Chapter 5, "Audit Evidence", the concept of materiality is discussed initially in terms of its external audit origins; however, this discussion is expanded upon through a quote from Anderson⁶ as follows: "In internal auditing ... an item would be considered material if an error in it (or its complete omission) would cause prudent, intelligent information users to change decisions that they might otherwise make on the basis of information provided by and about the auditee." Since internal auditors are mirrors to management of management's control systems, which in turn are important inputs to management's decision-making process, the above definition of materiality is equally applicable to managers and auditors. As used here, the term "materiality" reflects both aspects of risk; that is, size of potential risk and its probability of occurrence.

Inherent risk refers to the natural error rate of the process under audit. No process is error free and reducing the natural error rate may be prohibitively expensive. This fact must be taken into account in any evaluation of risk potential. Assuming that the inherent risk is tolerable, risk potential then has to do with an incremental error (i.e. the risk of tolerating errors which exceed the inherent process error rate by a material amount) not with the absolute error.

Control risk is the risk of not detecting material deviations of the actual error rate from the acceptable error rate. Control risk is a measure of confidence that the manager, or any observer, has in the control system rather than a measure of the absolute risk of the system under control.

Finally, and most importantly, we will discuss the concept of risk potential as it applies to audit assignment planning. The concept of materiality in terms of potential error in an assertion is helpful in discriminating between those areas most likely to have material variances and those that are not; however, for those cases where resources are insufficient to cover all areas where material error is likely to occur, additional criteria will have to be developed, by the audit team leader, for resource allocation decisions.

6 R.J. Anderson, The External Audit.

The preceding scarce-resource-allocation decision can be stated in the following form: How much are we willing to pay for the additional information that we are likely to obtain from an internal audit of the area in question (in terms of the key decision(s) to be made in that area)? If the projected cost of information we expect to gain is less than the potential improvement in the subject decision-making process, then the audit resources should be allocated accordingly, in proportion to the improved results expected. This is an opportunity cost decision.

The criterion most appropriate to this particular opportunity cost decision is risk potential, in either potential real loss or potential opportunity loss terms. The methodology for assessing risk potential, in these terms, is developed in Volume I, Chapter 3 and Appendix C of the Internal Audit Handbook. An illustration of its use is provided in Appendix A to this Part.

From the foregoing, and a review of Volume I⁷, it will be evident that the key factor in resource allocation is that of "risk potential". All of the other factors are utilized (directly or indirectly) in the determination of risk potential through its two major components, i.e. "materiality" or "probability of occurrence").

Having identified potential risk areas for examination, the team leader must develop an overall strategy which will ensure that all the most significant audit areas are covered in the most effective and efficient manner. The audit strategy should be such that it encompasses:

- adequate coverage of all major audit areas;
- an approach consistent with the scope and objectives of the audit; and
- appropriate extent and depth of testing.

7 Internal Audit Handbook, Volume I, Chapter 3 and Appendix C.

The critical factors in developing the overall audit approach will be the scope of the audit and the audit objectives established. At this stage of the audit it is not expected that detailed procedural guides will be prepared but rather that the general thrust of the audit approach will be determined and broad lines of inquiry established.

The depth of the audit and the extent of testing will be determined largely by the audit objectives proposed, needs of the potential users, results of the review phase and availability of time and human resources. At this stage the team leader should be in a position to outline the depth of coverage and estimate the proposed extent of testing in general terms. Further development of these factors will take place during the review and evaluation phases of the assignment and will crystallize in the verification audit plan.

Communication of Audit Purpose, Scope, Objectives and Approach

Once the team leader has defined the purpose and scope parameters, established specific audit objectives and developed a general audit approach, it is usually desirable to discuss these with the audit manager and auditee. Normally, there will be a preliminary discussion between the team leader and the audit manager followed by a review with the auditee and a final approval by the audit manager.

Discussion of the general goals and thrusts of the audit will likely be incorporated in the agenda for a preliminary meeting with the auditee. Normally, the team leader will outline to auditee management the audit purpose, scope and objectives developed, the predetermined control model (if already developed), the sources of criteria to be used and the general audit strategy proposed.

In addition to keeping the auditee fully informed, this discussion will also seek to elicit any concerns or disagreements the auditee may have with the proposed framework. Where these are significant, it may be necessary to re-evaluate or modify the audit approach to incorporate management's suggestions and concerns. Only after the preliminary meeting and consideration of auditee input will the team leader be in a position to finalize the scope and objectives of the assignment for review with the audit manager.

Review procedures may vary from one audit group to another, but generally will take the form of a memorandum from the team leader to the audit manager with a copy to the director, outlining:

- the proposed purpose, scope, audit objectives and related source of criteria;
- the proposed lines of inquiry;
- the degree of consistency with long-term and annual plans; and
- the assumptions and proposals for amendment where it is judged that the original terms of reference are inadequate.

At this stage, the audit manager will usually discuss the proposed audit approach with the team leader to ascertain that the audit coverage is appropriate and adequate, that appropriate auditee input has been incorporated into the plan and that the audit approach is likely to be both feasible and cost justifiable. If the audit manager is satisfied on these points, approval of the preliminary plan may be expected and the team leader can then proceed with the identification and allocation of resources and with scheduling.

Identification of Staff and other Resources Required and Assignment of Responsibilities

In most instances, the annual plan will contain some indication of the staff resources to be assigned to each audit assignment as well as the dates within which these resources will be made available to the team leader. These are constraints which the team leader must take into account when determining the staff resources required for the successful completion of the audit and the deployment of those resources to ensure they are utilized to best advantage. This process will typically fall into three stages:

- identification of quantity and quality of staff resources required, including the identification of necessary specialist skills;

- matching the staff resources required to the resources available; and
- assignment of responsibilities within the audit team.

The team leader must determine the skills required and the appropriate experience levels necessary. The techniques for arriving at this determination will depend on the auditor and the circumstances, but the following general approach may be useful:

- develop a matrix indicating audit areas to be covered against resource skills necessary to carry out the audit satisfactorily; and
- assess the expected time commitments for each resource identified on the matrix.

This exercise will provide an indication of:

- the quantity and quality of resources required;
- whether there is a requirement for specialist skills and, if so, in which area of the audit they will be needed;
- the time requirements for each resource and for the audit as a whole; and
- the extent to which the resource requirements match the resources assigned to the audit in the annual plan.

A sample resource requirement matrix is outlined in Table 1.

Table 1
Sample Resource Requirement Matrix

| Audit Issues | Skills Required | | | | | Time Required |
|---------------|-----------------|------------|-----------|----------------|------------------|---------------|
| | Team Leader | Auditor II | Auditor I | EDP Specialist | Other Specialist | |
| 1. | 20 | 30 | 30 | | | 80 |
| 2. | 40 | | 60 | | | 100 |
| 3. | 40 | | 30 | | | 70 |
| 4. | 10 | 60 | | | | 70 |
| 5. | 30 | | | 70 | | 100 |
| 6. | 25 | 25 | | | 50 | 100 |
| Time Required | 165 | 115 | 120 | 70 | 50 | 520 |

In developing the total resource requirements for the assignment the team leader will need to consider other resource requirements to cover such items as travel time and costs, computer time and other related assignment expenses.

It should be emphasized that development of resource requirements is an inclusive process incorporating all resources necessary to complete the assignment (human, physical and financial).

From the matrix or other techniques employed to determine appropriate staff resources the team leader should be able to identify any requirement for specialist skills. Having defined the requirement, the team leader must then consider the availability of such skills. Where the appropriate specialists are available within the audit branch, the team leader will request their deployment to the audit team for the period required if this has not been provided for in the annual plan.

Where the required specialist skills are unavailable within the audit group, the team leader must consider alternatives:

- obtaining the skills from elsewhere in the host organization (i.e. temporary assignment or secondment);
- obtaining specialists externally (i.e. by contracting);
- stretching existing skills; or
- altering the scope of the assignment.

These alternatives represent major project decisions and should be referred to the audit manager or director for consideration. The responsibility of the team leader is to review the requirement and develop proposals best suited to the achievement of the audit objectives, or revise the objectives.

All of the alternatives require additional planning. In particular, the use of specialists complicates the normal audit process. A complication which affects the first three alternatives is that of appropriate division of labour. Then there are complications which are unique to the alternative chosen.

The division of labour issue is one of integrating audit and non-audit expertise so that optimum input from each may be brought to bear on the result. There are two key ways in which experts may be employed to advantage.

If the expert is a subject matter or function expert (e.g. an expert recruited from a specific program such as Environmental Protection or from a specific function such as EDP or Personnel), that expertise may be used to advantage in: the creation or updating of the predetermined control model and in its validation; the development of audit verification programs for substantive testing (determining the objectives, key variables and parameters); and the interpretation of the results.

Technique-oriented experts (e.g. statisticians, econometricians, operations research specialists) could be used directly in the development stages and indirectly (for advice on the use of specialized audit methodology and techniques) during the rest of the audit assignment process.

Complications which are unique to the alternative selected include the following:

- (1) In-house specialists would have to be assigned in such a way that their special skills are used to advantage and the effect of their lack of audit skills is minimized. Basically this means that they are used primarily in the methodology and techniques-bound phases of the audit process, particularly in the "review" process.

If they are expected to become a regular part of the audit cadre in due course, then in addition to the productive part of their assignment there should be training or apprentice activities built into the schedule, where the specialists would be assigned to an auditor as an assistant for development purposes and, possibly, scheduled for formal training courses as well.

- (2) Where the specialist is seconded from a program or functional group elsewhere in the host organization, then the assignment would have to be arranged so that conflict of interest is avoided and the future of the secondee is not adversely affected by the assignment. There are two ways in which these possible effects may be avoided:

- (i) avoid using secondees on audits of their respective home organizations, and
- (ii) use them only in the review phase, as opposed to the evaluation and reporting phases, of the audit process.

- (3) In the case of resources on contract, there is the problem of whether the specialist is to work under supervision of the in-house team leader or autonomously. If the specialist works under supervision of the team leader, then the process can be relatively informal and treated similarly to the case of the audit group, in-house specialist. Where the specialist works autonomously, under supervision of the parent accounting or consulting firm, the terms of reference of the contracts will have to be much more precisely defined.

When resource requirements and availability have been established the team leader must ensure that audit responsibilities are assigned clearly and that resources are used to maximum advantage.

Preparation of Time Budget and Work Schedule

The team leader must develop an overall workplan during the assignment planning phase which will:

- provide a framework for work scheduling and staff management;
- reflect the audit approach and the emphasis therein;
- be sufficiently flexible to allow for the most efficient use of resources;
- provide a mechanism to measure the progress of the audit through milestone dates; and
- provide information for future audit planning.

To prepare a workplan which will satisfy these requirements and provide the team leader with a useful audit management tool, a plan must be developed which is more than a simple time budget and a list of audit milestones. It is essential that the human and time resources available be integrated with the timing and scheduling constraints imposed by the nature of the audit and the requirements of the auditee. It may be necessary not only to allocate time to specific tasks and staff, but also to establish when that time should be spent on a calendar basis, so as to satisfy both scheduling (auditor and auditee requirements dealt with) and milestone requirements. To achieve this, the team leader should:

- define clearly the total time required for completion of the assignment;
- establish accurately the availability of required resources;
- ascertain carefully the key audit milestones; and

- prepare an audit time and scheduling workplan, possibly in matrix form, setting out the audit areas to be covered against the available resources.

The team leader will thus determine the total estimated time required for the completion of each audit area and allocate that time among the staff assigned for audit work in each area. The resource identification matrix suggested earlier in the planning phase will usually serve as a basis for this plan.

Once the time budget has been developed, the team leader will need to refer to the key milestones and scheduling constraints to determine which areas, if any, require modification.

From this exercise the team leader will derive an audit workplan which will indicate clearly:

- total time required;
- time allocated to each audit component;
- time allocated to each staff member; and
- dates between which the audit work will be performed.

Normally, this workplan will be incorporated in the assignment planning memorandum and will be in a form similar to that outlined in Figure 4.⁸

⁸ See Volume I, Appendix A, for a departmental example of an audit assignment status report.

WORKPLAN

A. Human Resources

| Audit Areas | Audit Schedule | Timing | | | | Budget Allocation | | | | | | | |
|----------------|-------------------|--------|------|-------|------|-------------------|------|---------|------|---|------|-------|------|
| | | From | | To | | Team Leader | | Auditor | | Specialist | | Total | |
| | | Proj. | Act. | Proj. | Act. | Proj. | Act. | Proj. | Act. | Proj. | Act. | Proj. | Act. |
| | | | | | | | | | | | | | |
| | | | | | | | | | | Legend: Proj. = Projected Act. = Actual | | | |

B. Other Resources

| Resource | Related audit area | \$ |
|------------------|--------------------|----|
| 1. Travel costs | | |
| 2. Computer time | | |
| 3. Other | | |

Figure 4

Planning of Audit Working Papers

The team leader should carefully plan and prepare the working paper file for the fieldwork. In this regard, the table of contents is of particular importance (see Appendix B at the end of Part 1 for an example of a Working Paper Index). It should make provision for certain standard matters to be covered as the assignment progresses and establish the control reference for the working papers. Also, it will provide a check to ensure that all areas of the audit are covered and that all necessary documentation is on hand when the audit team goes to the field.

If the working papers are planned carefully in accordance with the objectives of the audit and the issues perceived to be important, they should correspond closely with the broad framework of the audit report, thus facilitating report drafting and referencing. (See Policy Interpretation Notice 1983-02 for a more detailed treatment of the subject of Working Papers.)

Preparation and Approval of an Assignment Planning Memorandum

The assignment planning memorandum is the principal product of the planning phase of the audit. It should provide a documented summary of planning information, audit considerations, assumptions and decisions taken. Also, it will constitute the overall audit plan for the assignment, serving as the basis to plan and conduct subsequent phases. The planning memorandum will form part of the working papers for the audit and it is essential that it be approved at the appropriate level before further work on the assignment begins.

An assignment planning memorandum should include as a minimum:

- a summary of the purpose, scope and objectives of the assignment and any limitations placed thereon;
- an overview description of the audit entity encompassing:
 - legislative authorities and mandate

- key objectives and goals
 - resources employed (human, financial and physical)
 - key organizational and operational issues and constraints
 - principal information and operational control systems
 - principal management control mechanisms
 - significant changes in operations, system and influences over the past two years or since the last audit
 - known or expected future influences on the audit entity, and
 - key assumptions made;
- principal issues and significant audit areas;
 - audit strategy decisions including the audit approach and general notes on audit technique decisions;
 - basic objectives and associated sources of criteria;
 - outline of audit report format(s) taking into account levels of reporting required;
 - resource requirements including identification of specialist skills;
 - time budget and critical milestone dates;
 - assignment of staff responsibilities;
 - any other significant considerations or outstanding issues; and

- confirmation of approval to proceed.

The assignment planning memorandum will be submitted to the audit manager in charge of the assignment for review. After discussion of details with the team leader, the audit manager will normally conduct a review with the internal audit director outlining the principal features of the assignment plan. Provided all requirements of the manager and director are satisfied, approval and authority to proceed with the fieldwork will be provided.

Communication with Auditee Management Prior to Commencing the Audit Fieldwork

Preliminary contact with auditee management during the planning phase is a critical dimension of the audit assignment. Typically, the contact will take the following form during the assignment planning phase:

Advance Letter to Auditee

The team leader in charge of the assignment will draft a letter(s) to be signed by the director of internal audit, addressed to the manager(s) of the unit to be audited. Copies to the senior executive accountable for the unit may also be required. This letter will normally be dispatched well in advance of the scheduled commencement date and will outline:

- the purpose of the audit;
- the scope, in general terms;
- the approximate time schedule and key milestone dates;
- the files, documentation and schedules likely to be required; and
- accommodation and facilities requirements, if necessary.

Preliminary Meeting with Auditee Management

The preliminary meeting with auditee management should be an informal meeting between management of the unit to be audited and the team leader. It will normally be appropriate for relevant members of the audit staff to attend. Depending on the nature of the assignment, it may well be appropriate for more than one level of auditee management to be present at this meeting. It is also worth noting that more than one meeting may be necessary in certain circumstances. The agenda will typically include:

- the broad purpose of the audit and, in general terms, the intended audit approach;
- notification to auditee staff of the audit team's requirements to access files and related documentation;
- discussion of timing requirements, milestone dates and any confirmation and physical inspection arrangements which may be necessary;
- general discussion of the activities of each of the elements of the unit to be audited;
- preliminary identification of areas perceived by the auditee as problems which may warrant a more concentrated audit effort;
- discussion of material changes in systems, operations or personnel; and
- a request for a typical list of documentation on the auditee area (a list of required documents should be provided to the auditee at the meeting).

This preliminary meeting will be held prior to the final determination of activities to be audited and resources required and will form a critical input to that process.

Presentation of Audit Plan to Auditee

Presentation of the audit plan to the auditee is normally arranged following completion and approval of the assignment planning memorandum containing the overall audit plan. This may take the form of an oral or written presentation or a combination of both. The presentation should cover the following matters:

- clear statement of audit scope;
- brief overview of the audit entity;
- major objectives and related sources of criteria;
- the general audit approach and indications of the techniques to be employed;
- principal issues identified and significant audit areas;
- critical timing requirements and milestone dates;
- the reporting procedure, including possibly an outline of the report and an assurance that the draft report will be discussed with the auditee management prior to its release to senior management and the audit committee; and
- in cases where a predetermined control model is not already available, the auditee's support (including dedicated resources) may be obtained at this time for participation in its development.

SECTION TWO: PRINCIPAL PRODUCTS

The principal products of the assignment planning phase are:

- statement of audit scope and objectives;
- overview of unit to be audited;
- resource requirement workplan (time, dollars, people, facilities);
- assignment planning memorandum; and
- briefing for auditee management.

LOWE-MARTIN

CHAPTER TWO

REVIEW PHASE

INTRODUCTION

Once the planning of the assignment has been completed, the audit team normally undertakes a detailed review of the audit entity to expand its understanding of its principal features and problems. The review phase of the audit is devoted to the gathering and validation of more detailed information concerning the entity's programs, objectives and activities, to the development or updating of the predetermined control model and to the identification of existing controls and potential control weaknesses.

SECTION ONE: PRINCIPAL COMPONENTS

The principal components of this phase are:

- expansion of the auditor's understanding of the entity (II.1)⁹;
- documentation of processes and systems (descriptive model)(II.2);
- validation of data (II.3);
- development or updating of the predetermined control model (II.4);
- comparison of descriptive model vs. predetermined control model (II.5);
and,
- preparation of control registers (II.6).

(Note: to the degree that this plan delineates the procedures to be followed by the auditor it, along with an expansion of steps II.1-II.5, comprises the front-end of what is often referred to as the "audit program". The remaining portion of the audit program would reflect procedures for verification and cause-effect analysis activities. (See Appendix C at the end of Part 1 for an example of an audit program.)

⁹ The numbers in parentheses refer to the components of the audit process as shown in Figure 3.

Expansion of the Auditor's Understanding of the Entity

Starting from the base developed in the planning phase, the auditor should review the information available carefully and comprehensively. This will enable the auditor to direct the knowledge gained towards the determination and investigation of significant issues and to determine the existence of required controls.

Much of the information required for this review will be available in the planning files or in previous internal audit files. What is required during the review phase is an expansion of this base of information in order to gain a more comprehensive understanding of the audit entity. However, this expansion process must be cost-effective.

The following may provide useful sources of reference for general information:¹⁰

- information gathered and documented during the planning phase;
- internal management reports and other relevant published communications of the audit entity;
- selected interviews with auditee management to obtain perspectives and concerns regarding specific items;
- documented policies and procedures applicable to major programs, systems and controls;
- studies and reports of internal/external evaluation groups; and,
- personal observation and assessment of the audit environment.

10 See Volume II, Part 2, Chapter 5, "Audit Evidence" for more extensive treatment of the subject.

Additionally, the review of available information should incorporate a further study of pertinent legislation and regulations, as required, to determine, clarify and confirm:

- the purpose, scope and objectives of the audit entity;
- the method of conduct, resourcing and control of activities; and,
- the nature and extent of the entity's authority and responsibility.

The organizational policies (departmental, branch, etc.) also should be reviewed carefully to ensure that:

- departmental policies conform with applicable legislation and central agency, guidelines, policies and regulations; and,
- policies are appropriate for efficient, effective and economical conduct of authorized activities.

Since much of this review will have been performed at a preliminary level during the assignment planning phase, a main objective of the review phase is to select, broaden or further develop the available sources of information to ensure a sound basis for the subsequent detailed analysis and evaluation.

Development or Updating of the Predetermined Control Model

A predetermined control model shows the significant points in a system's processes and the key results that should be subject to control; it also provides the objectives of the controls and the criteria used by the control in assessing performance. The need for a control in any particular location is determined by the degree to which management is willing to risk unwanted and undetected performance at the potential control point. (For a more detailed discussion on control concepts, refer to Volume II, Part 2, Chapter 2 of the Internal Audit Handbook.) Sources of criteria can be:

- legislation governing the operations and the outputs of the audit unit;
- central agency policies and directives which impact on the various administrative responsibilities of the auditee management (finance, EDP, personnel, official languages, etc.);
- departmental policies and procedures (including performance indicators or standards) which affect the management and activities of the audit unit;
- departmental plans, and associated key results indicators; and
- sound management principles and practices.

Ideally, the predetermined control model would have been developed as an independent exercise (jointly with auditee and central agency managers/experts, as required) prior to the audit assignment.

If a predetermined control model has already been developed as part of a central agency or departmental audit guide, it should be used as a starting point and modified, if need be, to suit the needs of the audit assignment. This will help to ensure the integrity and cost-effectiveness of the audit process.

In developing a new predetermined control model or modifying an existing one, the auditor will want to ensure that the model is appropriate to the characteristics of the audit entity. On the other hand, it is equally essential that there be no weakening of the auditor's objectivity (i.e. that the predetermined control model is not simply a reflection of the auditee's actual control framework). One way of minimizing bias is to segregate responsibility for the documentation of the system in existence and the development of a control model against which to evaluate that system. Where such segregation is planned, the team leader will often assume responsibility for the development of the predetermined control model and will assign responsibility for the existing system's documentation to the audit staff, usually under direction of a delegated team leader.

Finally, it is important that the team leader seek and obtain the auditee's acceptance of the predetermined control model and its embedded criteria. This will prove to be very useful in gaining the auditee's acceptance of subsequent audit observations and conclusions. If the auditee management has accepted the sources of criteria identified in the planning phase, then it is quite likely that the predetermined control model will be equally acceptable.

Documentation of Existing Organization Structures and Program/Support Delivery Systems

Modelling techniques¹¹ are usually appropriate for the recording of process or system structures. There is a wide range of modelling techniques available to the auditor including:

- narrative systems descriptions;
- organization charts and responsibility diagrams or other pictorial methods of modelling organizations; and,

11 See Volume II, Part 2, Chapter 4, "Analysis Concepts and Practices for Internal Auditing" for a further discussion of modelling techniques.

- outline or procedural flowcharts or other pictorial methods of modelling systems and procedures, sometimes supplemented with decision tables.

The level of detail necessary for any model of the entity is a matter for the auditor's judgment, but normally will be influenced by the nature and complexity of the audit entity and the scope of the audit in question. Additionally, the skills available within the audit team for preparation and interpretation of models may place further constraints on the detail or specificity to be provided. The auditor must establish whether, in fact, any modelling is necessary and establish whether the benefits outweigh the cost of preparation (time and resources).

Documentation of the systems and processes of the audit entity most often will address the following areas:

Organizational Structure and Relationships

For most audits and particularly for functional and organizational audits, models of the management organization structure and relationships and their dynamics are valuable to the auditor. Documentation normally can take the form of organization charts which may be available from the audit entity or require preparation by the auditor. Depending on the nature of the audit the charts may outline:

- the hierarchy of corporate management and any direct reporting relationships; or,
- the dynamic organizational structure of corporate management encompassing both direct and functional relationships and responsibilities.

Management Control Framework¹²

The auditor can document the system of management controls by:

- developing narrative system descriptions;
- preparing outline or detailed procedural flowcharts;
- identifying key decision and control points; and,
- identifying procedures in place to control exceptional situations.

The auditor will require an understanding of general accountability relationships and requirements. To obtain such an awareness, the auditor will review adherence to central agency policy directives, conformity with corporate policies and guidelines and management control over financial, human and physical resources and program performance. The review must be appropriately documented in either narrative or outline form.

Whatever form the auditor's system description or accountability relationships take, they should always include as a minimum for each area examined:

- the objectives of the system and its place in the organization;
- a description of the activity, its influence and its results;
- key volume/dollar statistics;
- organizational and management authorities and responsibilities; and,
- identification of key controls and linkages to other control mechanisms.

¹² See Volume II, Part 2, Chapter 3, "Management Control: Concepts and Practices" for a detailed discussion.

Program and Support Activity Delivery Systems

Preparation of program structure or logic models may be useful to enable the significant aspects of a program to be identified for discussion with auditee management. The auditor can outline program structure and logic by:

- defining significant program components or activities including defining organizational units and functions established to provide for program delivery;
- determining the program/activity delivery system;
- determining the outputs related to each program component;
- assessing whether program objectives are consistent with the mandate of the entity or identifying where variances appear to exist;
- assessing measurement and reporting of program effectiveness; and
- repeating the foregoing sequence for support activities.

Validation of Data

Having prepared documentation on the process or system under review the auditor must now undertake limited testing procedures to:

- verify the accuracy of the data collected; and,
- develop an initial assessment of the operation of management controls.

Methods employed to verify the accuracy of the data collected will include:

- a discussion of organization models, flowcharts and other system documentation with auditee personnel involved in the process in order to establish the accuracy of the representation; and,

- the selection of a sample of the elements of a process or transactions within a system for a walkthrough.

A walkthrough is a practical method of verifying the accuracy of systems documentation which provides a preliminary indication of the existence and effectiveness of process¹³ and results controls. However, the walkthrough does not constitute a detailed verification procedure nor does it involve the collection and examination of all pertinent audit evidence. Notwithstanding these qualifications, it is a useful mechanism to validate the accuracy of systems data and indicate whether the system or process functions as described.

The validation procedures may well disclose some discrepancies. There are two possible reasons for this:

- the system description, or expected results documentation, is inaccurate; or,
- the description is accurate but the system does not exist or behave as described.

If the auditor finds a discrepancy or any information that is inconsistent with the system description, reference to the original information sources is required before proceeding with any further data collection or testing. Under normal circumstances, any system breakdown would be noted at this point as information useful for a preliminary assessment. Further analysis will be performed during the evaluation phase. Only in exceptional circumstances, such as suspected fraud, should the matter be pursued further at this time and reported to the audit manager or auditee forthwith.

13 Here the term "process" is used to represent the general wherewithal to produce results.

In formulating a preliminary assessment of the operations of management controls, the auditor usually will want to consider:

- the adequacy of resources;
- the consistency between objectives and results;
- the existence and apparent effectiveness of information systems; and,
- any other concerns or areas of apparent significance.

Preliminary assessments are usually based on overview analysis and will not be substantiated by quantitative measures or detailed validation at this stage. From the limited testing performed during the validation of system descriptions, the auditor will be in a position to formulate preliminary observations relative to:

- the adequacy of organizational structures, plans, objectives and systems and procedures (i.e. the auditee's infrastructure);
- the economy, efficiency and effectiveness of the organization (i.e. the auditee's results); and,
- the existence and apparent adequacy of controls over resources and operations.

These preliminary observations should be documented in the working papers, but only in the exceptional circumstances, outlined earlier, will they be reported to the audit manager or auditee at this stage.

Limited Control Review and Identification of Potentially Significant Audit Issues

The auditor is now in possession of a body of information relative to the structure, management and operation of the entity under examination, together with a predetermined control model which indicates the control objectives of the entity. In evaluating the adequacy of the actual control framework, the auditor must match the existing controls with the predetermined control objectives. This will enable the auditor to identify:

- existing controls which meet the requirements of at least one control objective, including controls which operate in the environment external to the audit entity but affect its operations;
- control objectives for which no existing controls have been found; this identifies a potential weakness in the control framework of the audit entity; and
- existing controls for which no control objectives exist in the predetermined control framework; this could be an indication of either redundant and/or uneconomical control or an incomplete predetermined control model.

When an existing control is identified, it should be posted to a Register of Essential Controls (Table 2)¹⁴ along with all the control objectives from the predetermined control model which are satisfied by the existing control. Control objectives which cannot be matched to any control of the actual control framework should be listed in a Summary of Control Weaknesses (Table 3)¹⁴. These two documents together will form the starting point of the evaluation phase where the auditor will be required to assess the adequacy of the auditee's control framework.

¹⁴ The Register of Essential Controls and Summary of Control Weaknesses could, of course, be combined into one comprehensive table, if so desired.

Table 2

REGISTER OF ESSENTIAL CONTROLS

Prepared by: _____

Reviewed by: _____

| WORKING PAPER REFERENCE | NATURE OF ESSENTIAL CONTROL | NATURE OF VERIFICATION TEST | | RESULTS OF VERIFICATION AUDIT PROCEDURES | WEAKNESSES DEFICIENCIES REFERRED TO SUMMARY OF WEAKNESSES |
|-------------------------------|-----------------------------------|-----------------------------|---|--|--|
| | | Basis/Sample Size | Reference To Verification Audit Procedures | | |
| | | | | | |

Prepared by: _____

Reviewed by: _____

[illegible]

At this stage, the auditor will have conducted a limited control review (compliance testing)¹⁵ and should be in a position to determine those areas which may give rise to significant audit issues. These issues will normally be identified by the major differences between the predetermined control model and the documented control framework. Other significant audit issues may arise from:

- areas of concern identified in previous audits and still considered relevant;
- apparent ineffectiveness of controls (as opposed to non-existence)
- potential areas of uneconomical or inefficient operations;
- perceived weaknesses in the entity's capability to measure program effectiveness; and
- other specific management and operational characteristics when these are judged to be unusual.

The limited control review activity in the preceding outline, although performed as part of the review phase, is actually an evaluation activity. This is consistent with the view of the evaluation activity presented in Figure 2, which shows the evaluation phase as overlapping all the other phases. Significant audit issues will be substantiated in the verification phase of the audit assignment through substantive testing.¹⁶

15 See Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors" for a discussion of compliance and substantive testing.

16 Idem.

Preparation of a Plan for the Evaluation Phase

The purpose of the evaluation phase is to analyze the adequacy of the existing management control framework against the predetermined model and to identify any significant weaknesses and deficiencies. As indicated, the evaluation process has already started with the limited control review and associated activity described in the previous discussion. Therefore, the evaluation plan in the following discussion deals only with the remaining evaluation activities.

In preparing an evaluation phase plan the auditor will use as a basis: the products of the review phase - system documentation, predetermined control models, Register of Essential Controls, Summary of Control Weaknesses and a list of potentially significant audit areas.

The form of the evaluation phase plan will vary according to the nature of the assignment, but the plan should, as a minimum, contain:

- a list of audit issues considered significant upon which the evaluation phase will concentrate;
- an outline of the audit procedures to be employed incorporating:
 - methods for substantiating controls weaknesses;
 - sources of reference for evaluation (e.g. flowcharts or interviews);
 - an indication of the necessity for further, more detailed, system documentation;
 - methods for performing cause-effect analyses; and
 - an indication of areas likely to require further verification and the possible approach to be adopted.
- assignment of responsibility for detailed audit tasks; and,

- identification of documentation to be employed for the evaluation.

SECTION TWO: PRINCIPAL PRODUCTS

The principal products of the review phase are:

- a current predetermined control model(s);
- detailed documentation of existing management control framework;
- a "Register of Essential Controls";
- a "Summary of Control Weaknesses"; and
- a list of potentially significant audit issues.

CHAPTER THREE

EVALUATION PHASE

INTRODUCTION

Evaluation of the management control framework is the core of the audit process. It calls for the exercise by the auditor of a large measure of expert analysis and judgment. Evaluation, as an activity, is an iterative process and for this reason it cannot be regarded simply as part of a linear progression from the review phase to the verification phase. The evaluation activity begins during the planning of the assignment and continues through to the drafting of the final audit report. An understanding of these characteristics of evaluation has been assumed in the development of this guide.

SECTION ONE: PRINCIPAL COMPONENTS

The principal components of the evaluation phase are:

- comparison of descriptive model vs. predetermined control model (II.5)¹⁷;
- preparation of control registers and determination of important controls (existing and missing) (II.6, II.7);
- determination of requirement for additional data; and preparation and approval of detailed verification plan procedures (II.8, II.9);
- analysis of causes and effects of audit observations (II.11);
- development of audit findings, conclusions and recommendations (II.12); and,
- completion and review of audit working papers (II.13).

¹⁷ The numbers in parentheses refer to the components of the audit process as shown in Figure 3.

Evaluation of the Existing Management Control Framework against the Predetermined Model

This activity is started informally in the planning phase and carried out mostly during the review phase, but not completed until after the verification phase (see Figure 5 for an overview of the control evaluation process). During the review phase the auditor has matched the predetermined control model to the actual control framework and identified both existing controls and potential control weaknesses. During the planning for the evaluation phase, the auditor will have identified which audit issues are considered significant and upon which the audit will now concentrate. In order to evaluate the adequacy of the control framework, the auditor must now identify the existing controls and apparent control weaknesses which are critical and which warrant further evaluation and possible verification before a decision can be made as to inclusion in the audit report.

With respect to the critical objectives that the auditor has concluded are relevant, the evaluation process should be completed, as far as possible, by reference to the information gathered during previous phases of the audit. Assessment should be supported by evidence and referenced to its source. If insufficient evidence exists at this point, it should be noted for inclusion in the verification plan.

Identification, Evaluation and Documentation of Control Weaknesses

The purpose of this critical component of the audit assignment is to review the Register of Essential Controls and Summary of Control Weaknesses prepared in the review phase and identify:

- management and process controls which are essential and critical to the effective operation of the system and are considered to have or suspected of having significant weaknesses;
- controls which serve a useful role in the operation of the system but are not considered critical enough to warrant further investigation;

AUDIT PROCESS ACTIVITIES AND MAJOR WORK INSTRUMENTS

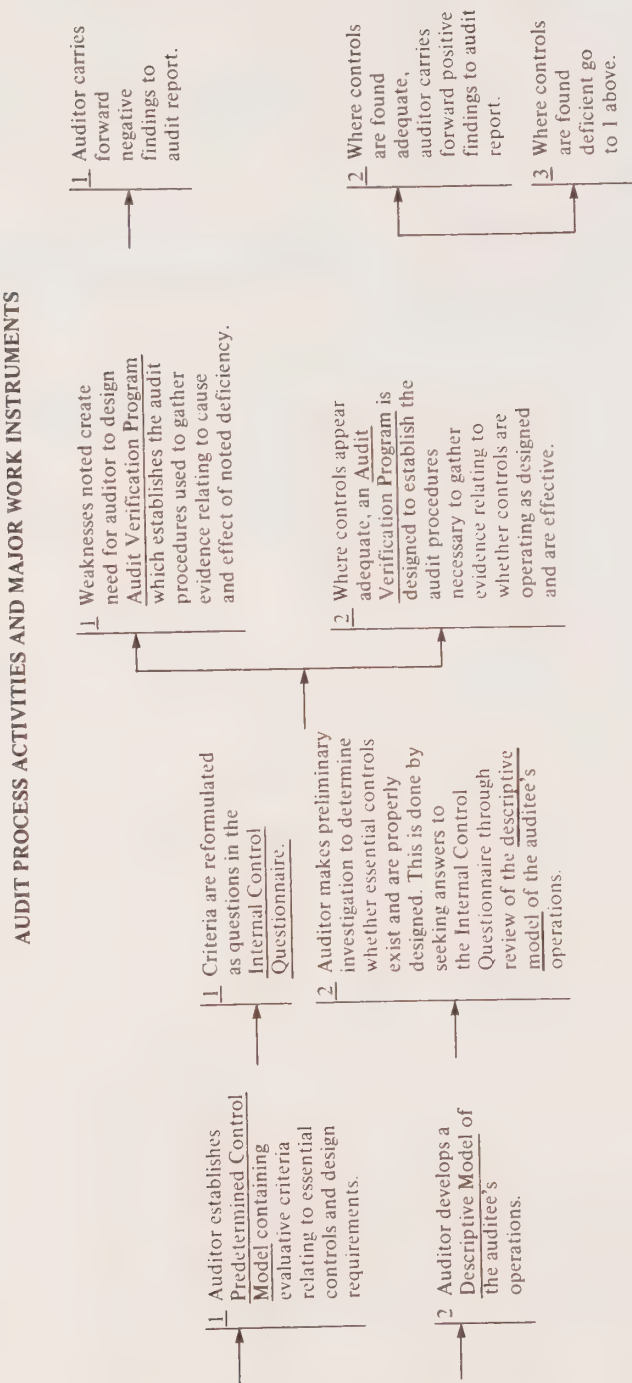


Figure 5

- controls which appear to be of no purpose to the organization or to the environment surrounding the organization; that is, controls for which no matching control objectives exist in the predetermined control model;
- control deficiencies or weaknesses likely to give rise to significant loss, error or inefficiency and for which further investigation is likely to be cost effective; and
- control deficiencies and weaknesses not considered significant enough to warrant further investigation.

The assessment by the auditor of the significance of control weaknesses should be recorded in the Summary of Control Weaknesses. This summary will provide:

- a means of documenting in an organized manner the control weaknesses deemed significant;
- a record of procedures and tests developed to test the effectiveness of essential controls or to assess the effect of control weaknesses;
- a record of the results of the substantive testing of essential controls; and
- a record of weaknesses in the operation or absence of essential controls.

At this point in the audit, the auditor may wish to report, on an informal basis, to the auditee any information on control weaknesses which are deemed to be not significant, but for which minor problems have been identified which could be easily rectified by the auditee management. This will help ensure continuous and effective communication between the auditee and the auditor and will enhance the perception of the audit function as a helpful tool to management at all levels.

Development of a Detailed Verification Plan

The auditor must now determine whether additional verification is required to substantiate findings, hypotheses and assumptions as illustrated in Figure 5 and if so, the extent of the verification procedures required. This will require consideration of:

- those issues identified earlier in the audit which now appear less significant and warrant no further investigation;
- those issues which are of major significance but require no further verification to support audit observations;
- those issues of major significance which require further verification; and,
- the essential controls identified as being in place, the existence and effectiveness of which must be substantiated.

The objectives of the verification plan are:

- to determine that controls listed in the summary of essential controls operate as designed and are effective; and,
- to gather data in support of the analysis of the cause and effect of the significant weaknesses, deficiencies and inefficiencies listed on the Summary of Control Weaknesses.

To achieve the verification audit objectives the verification plan should be designed:

- to provide assurance that the balance of systems are operating effectively;
- to verify deficiencies, inefficiencies and weaknesses;

- to determine or verify assumptions as to the causes and effects of identified weaknesses;
- to outline the detailed objectives and procedures for each verification step; and,
- to employ techniques appropriate to the objectives and the nature of the audit unit being examined.

Given that verification activity is typically a costly one, it should be noted that if the auditor proposes any major changes to the verification phase from that planned for during the assignment planning phase, it may be appropriate for such changes to be reviewed and approved by the audit manager prior to commencement of detailed verification procedures. The purpose of this review is to eliminate the possibility of any misdirected audit emphasis.

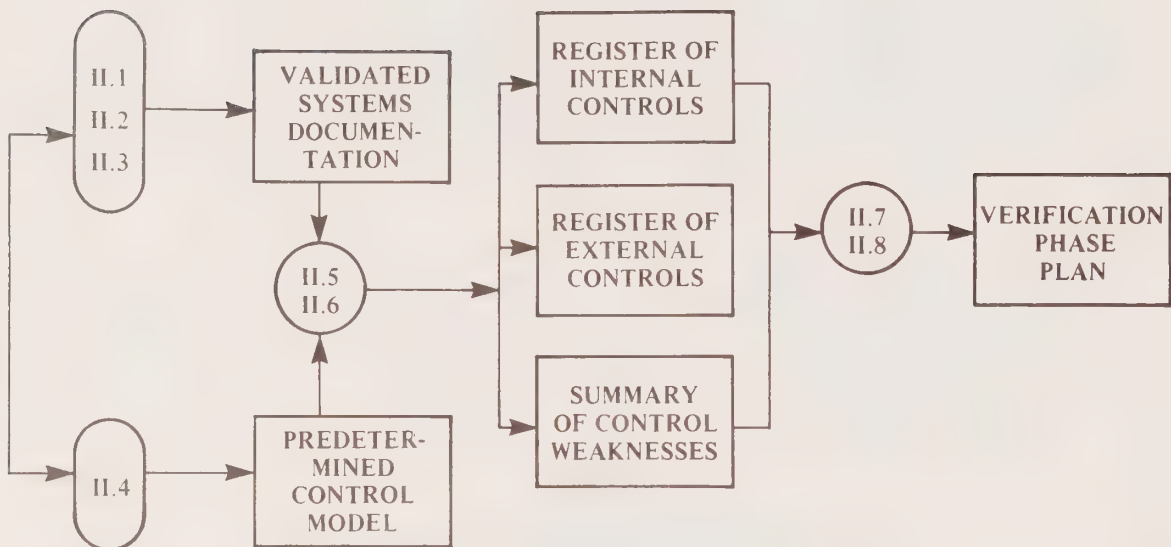
Where warranted, the auditor would now proceed with the verification phase of the audit (see Figures 5 and 6).

Analysis of Causes and Effects of Audit Observations

On completion of the necessary procedures to substantiate existing controls and significant deficiencies, inefficiencies and weaknesses, the auditor will be in possession of a body of audit observations recorded on the Register of Essential Controls and the Summary of Control Weaknesses.

To develop the audit findings, conclusions and recommendations, the causes and effects of audit findings must be analyzed as depicted in Figure 7. The focus of this analysis is to substantiate hypotheses on the reasons for, and the significance of, failure to match the specified criteria. The amount of analysis should be cost-effective.

DEVELOPMENT OF VERIFICATION PLAN



- II.1 EXPANSION OF AUDITOR'S UNDERSTANDING OF ENTITY
- II.2 DOCUMENTATION OF PROCESSES AND SYSTEMS (DESCRIPTIVE MODEL)
- II.3 VALIDATION OF DATA
- II.4 DEVELOPMENT AND/OR UPDATING OF PREDETERMINED CONTROL MODEL
- II.5 COMPARISON OF DESCRIPTIVE MODEL VS. PREDETERMINED CONTROL MODEL
- II.6 PREPARATION OF CONTROL REGISTERS
- II.7 DETERMINATION OF IMPORTANT CONTROLS (EXISTING AND MISSING)
- II.8 DETERMINATION OF REQUIREMENT FOR ADDITIONAL DATA

Figure 6

CAUSE-EFFECT ANALYSIS

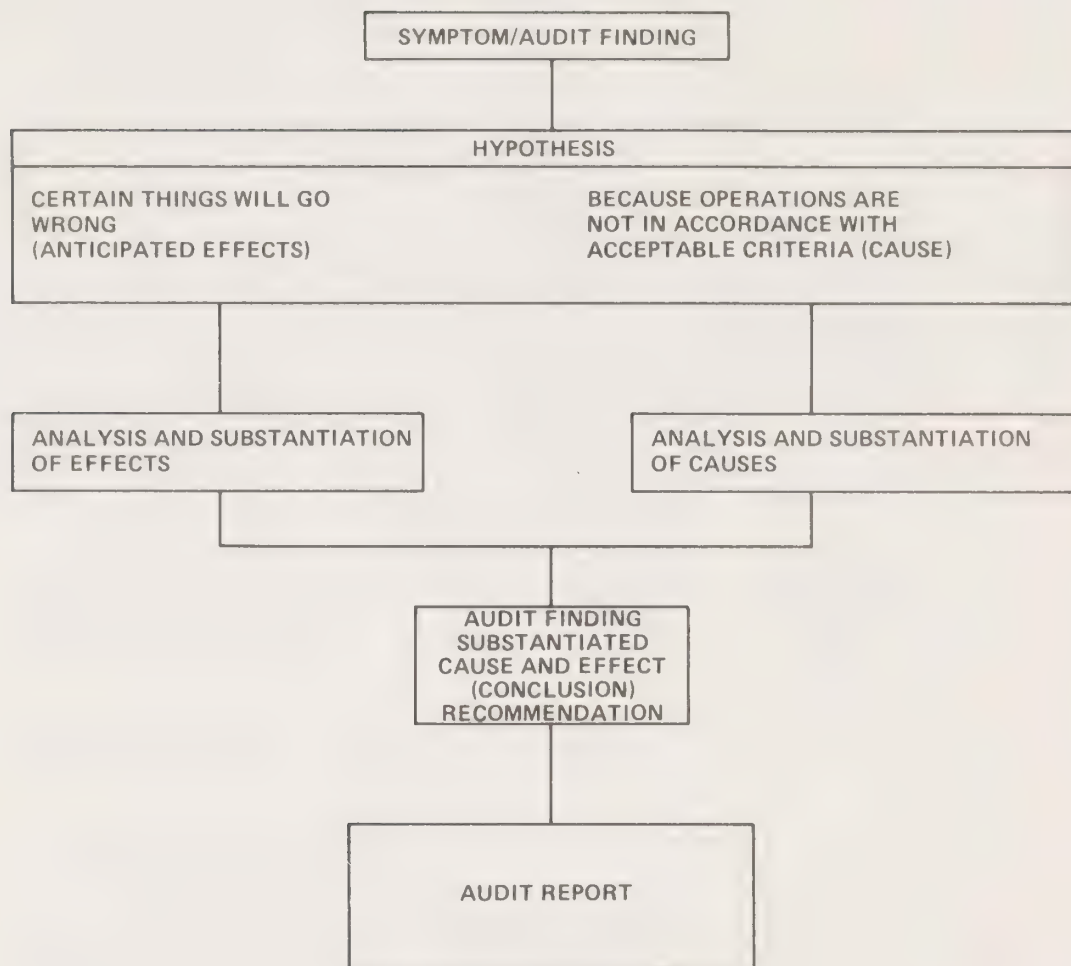


Figure 7

In the analysis of audit observations the auditor must bear in mind that:

- cause and effect are inter-related; and,
- causes may be external to the organization or process and may arise from the directives of central agencies or other external influences beyond the boundaries of the audit entity.

The auditor should clearly state the problem which is revealed by an audit finding or group of findings. The findings should relate to the control weaknesses that were observed in the course of the review phase and substantiated in the verification phase.

Having determined the problem and its cause the auditor must consider the possible effects on the audit entity. These will usually be derived from the control objectives outlined in the predetermined control model and backed by appropriate cost-benefit analysis. Figure 8 provides examples for the schematic form shown in Figure 7.

Development of Audit Findings, Conclusions and Recommendations

At this stage of the assignment, the auditor will have accumulated a list of findings from the review and evaluation phases of the audit. Several will have been substantiated further by various verification procedures and analyzed for cause and effect. For each finding a summary should be prepared which will normally outline the following:

- area/activity audited;
- summary of the audit findings, quantified where possible;
- analysis of causes and effects; and,
- reference to detailed audit working papers.

EXAMPLE OF FINDINGS - CAUSE AND EFFECT ANALYSIS

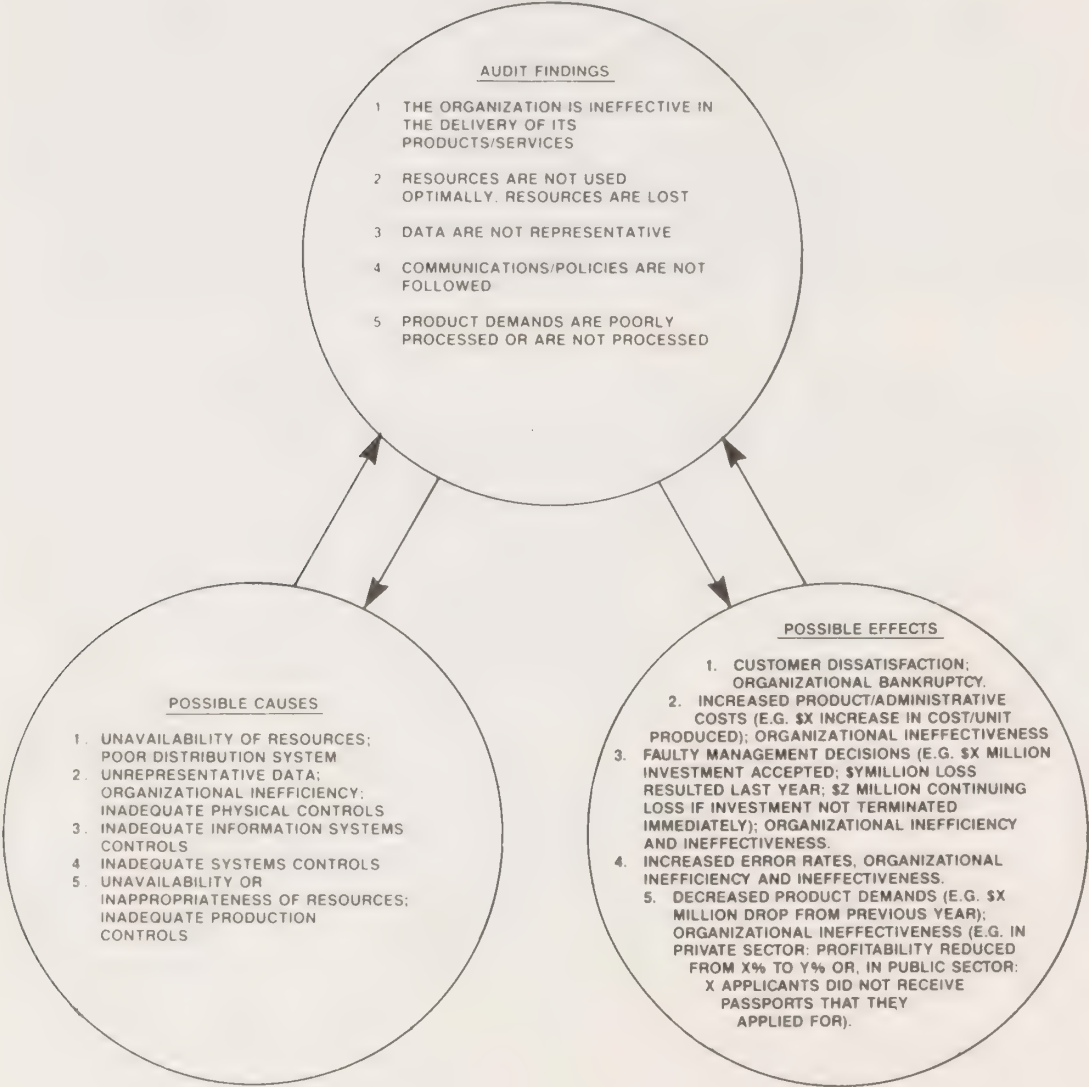


Figure 8

From this summary the auditor will be able to refine the findings into preliminary conclusions for inclusion in the draft audit report.

There are two types of audit findings - opinion-based and fact-based.

Opinion-based findings may relate to such issues as:-

- quality of decision processes;
- adequacy of work methods;
- coherence of systems;
- integrity of communication and information systems; and,
- the need for control procedures.

Fact-based findings are those which may be expressed in terms of factual data - dollars, units of production, person years, etc.

In developing audit findings the auditor should ensure they are:

- material or significant in relation to the unit examined;
- supported adequately and appropriately by audit evidence;
- validated and agreed with auditee management; and,
- analyzed with respect to cause and effect.

In the development of audit conclusions, the effect or implication of the deficiencies, inefficiencies or weaknesses identified in the findings will be recorded.

The auditor will normally develop conclusions from:

- an evaluation of variances resulting from deficiencies or weaknesses;
- measured effects of those weaknesses; and,
- discussion of results with auditee management.

Audit conclusions should be:

- based on a careful analysis of the effects of problems identified in the audit unit;
- stated clearly and unambiguously;
- expressed in quantifiable terms whenever possible; and,
- developed with an awareness of the total environment within which the unit operates.

The development of recommendations should offer reasonable and practical suggestions for corrective action to remedy control deficiencies, inefficiencies and weaknesses.

The auditor should consider the possible and feasible corrective actions available in the context of the audit unit and must assess carefully the cost-benefit considerations of recommending additional controls. Once a range of feasible suggestions has been developed, the auditor must select the most appropriate one and express, as clearly as possible, the recommended course of action and the responsibility for implementing the recommendation. Audit recommendations should always be so framed as to address what course of action is suggested, but should not venture into the manner of implementation, (the how) as this is the domain of management.

Figure 9 illustrates the process of developing audit findings, conclusions and recommendations.

DEVELOPMENT OF AUDIT FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

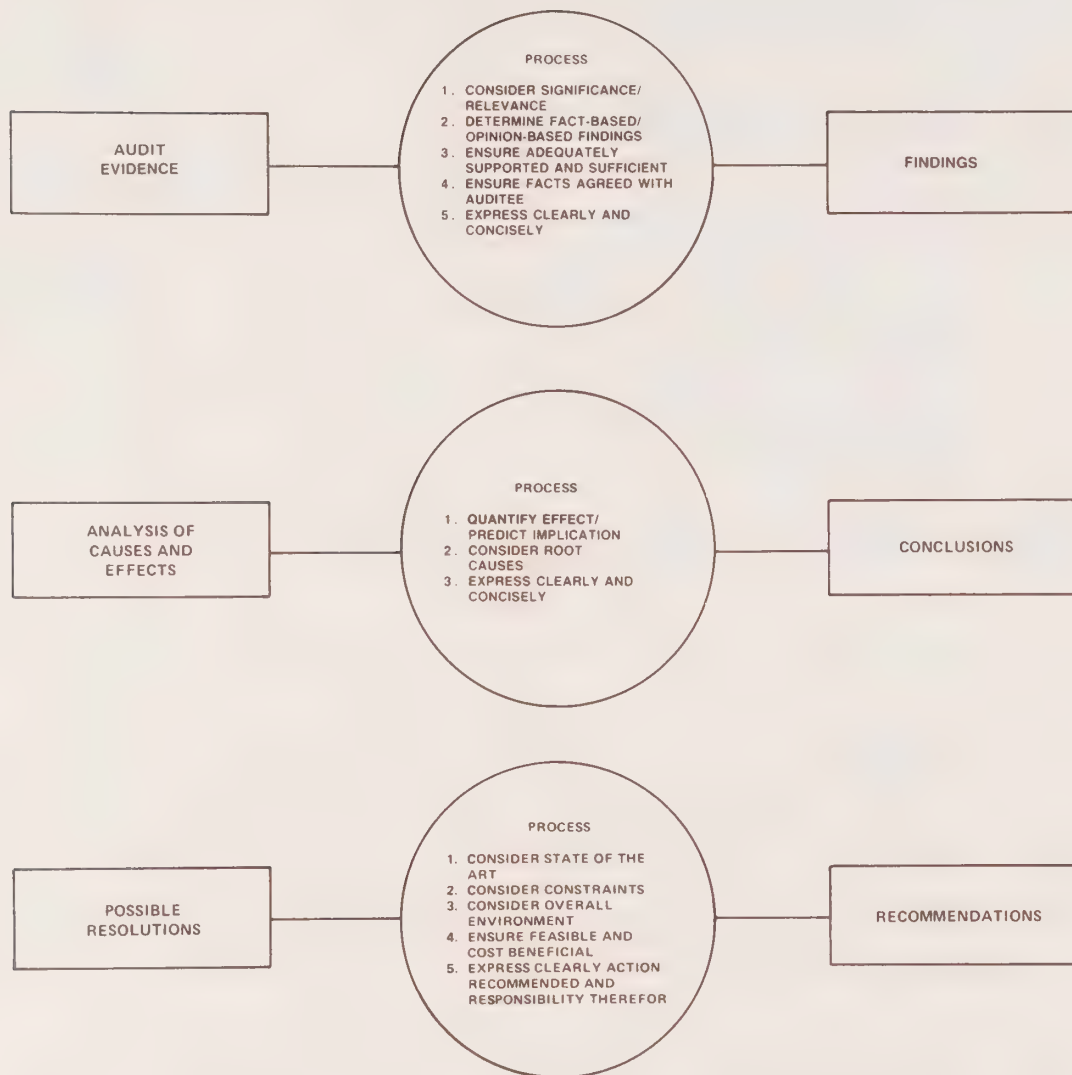


Figure 9

Completion and Review of Audit Working Papers

Audit working papers should be reviewed on a regular basis by the team leader as the audit progresses. As a minimum, the audit manager should review them at the end of the verification phase as illustrated in Figure 10.

The audit manager's review should ensure that:

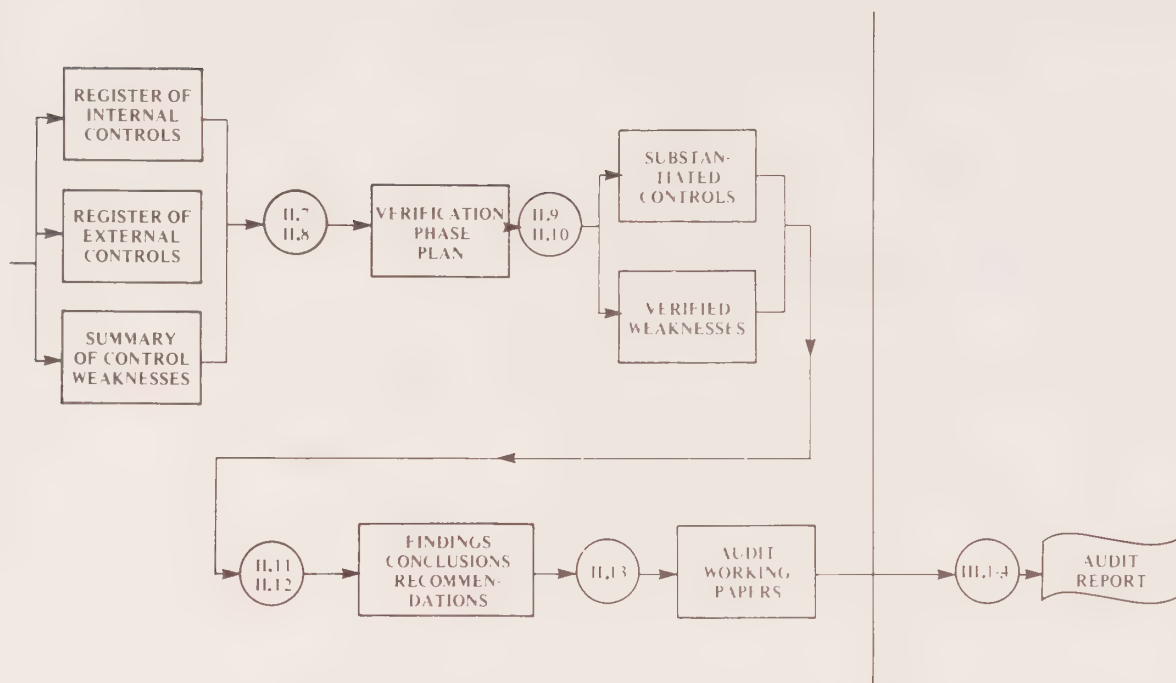
- audit coverage has been adequate;
- files and working papers are complete; and,
- appropriate evidence has been obtained and documented to support audit observations.

To adequately substantiate audit findings the working papers should include:

- audit procedures and the nature and extent of audit work performed;
- appropriate documentation of unit's systems, activities and controls;
- evidence of supervisory review;
- evidence of a quality control review, where applicable, of the conduct of the audit; and,
- appropriate index and cross-references.

Standard review checklists should be developed to provide the basis for, and evidence of, supervisory review. Appropriate levels of directorate and project management will complete applicable portions of the review checklist in the course of their review, and the completed checklist will form part of the audit working papers. (See Volume I, Chapter 4 for a further discussion of working paper review and sample check lists).

WORKING PAPER REVIEW



- II.7 DETERMINATION OF IMPORTANT CONTROLS (EXISTING AND MISSING)
- II.8 DETERMINATION OF REQUIREMENT FOR ADDITIONAL DATA
- II.9 PREPARATION AND APPROVAL OF DETAILED VERIFICATION PROCEDURES
- II.10 PERFORMANCE OF DETAILED AUDIT TESTS AND OTHER VERIFICATION PROCEDURES
- II.11 ANALYSIS OF CAUSES AND EFFECTS OF AUDIT OBSERVATIONS
- II.12 DEVELOPMENT OF AUDIT FINDINGS, CONCLUSIONS AND RECOMMENDATIONS
- II.13 COMPLETION AND REVIEW OF AUDIT WORKING PAPERS

- III.1 PRESENTATION OF AUDIT FINDINGS TO AUDITEE
- III.2 PREPARATION OF AUDIT REPORT
- III.3 PRESENTATION OF AUDIT FINDINGS TO AUDIT COMMITTEE
- III.4 AUDIT REPORT FOLLOW-UP

Figure 10

SECTION TWO: PRINCIPAL PRODUCTS

The principal products of the evaluation phase are the following:

- Register of Essential Controls;
- Summary of Control Weaknesses;
- plan for the verification phase;
- audit findings, conclusions and recommendations;
- completed audit working papers.

CHAPTER FOUR

VERIFICATION PHASE

INTRODUCTION

This phase of the audit concentrates on the in-depth verification of essential controls and the further substantiation of significant deficiencies, inefficiencies and weaknesses. It is designed to collect sufficient additional, reliable evidence to support audit findings and to report on significant issues. It is essentially an adjunct to the evaluation phase, designed to consolidate preliminary observations and to provide evidence for the analysis of causes and effects and development of audit findings which are the principal output of that phase.

SECTION ONE: PRINCIPAL COMPONENTS

The principal components of the verification phase are:

- preparation and approval of detailed verification procedures (II.9)¹⁸; and,
- performance of detailed audit tests and other verification procedures (II.10).

Preparation and Approval of Detailed Verification Procedures

It is the responsibility of the team leader to prepare the detailed audit procedures for use in the verification phase. Once the procedures have been developed, the team leader should review them with the audit manager before field testing commences. When the audit manager has approved the procedures as appropriate for use in the audit, the team leader assigns responsibilities for their execution.

¹⁸ The numbers in parentheses refer to the components of the audit process as shown in Figure 3.

Some of the more important steps involved in the development of audit procedures for verification testing normally will include:

Reviewing Specific Audit Criteria

Specific general and detailed audit criteria will have been developed during the review phase, but may require further review and development at this stage. Detailed procedural testing of controls may require more detailed sub-criteria and these should be developed and discussed with the auditee prior to conducting verification testing.

Defining the Population

The population to be tested will depend on the objectives of the audit. In an audit of a transaction processing system the population will be all transactions taking place during the period under review. In an audit of effectiveness the population may be more restricted or significantly expanded. Whatever the size of the population, the auditor should attempt to determine its principal characteristics and the best means for reviewing them.

Selection of Methods of Testing

Once the auditor has established the principal features of the population, the most appropriate method of testing must be determined. Some techniques are discussed in Part 1, Chapter 2 and a more detailed discussion is contained in Part 2, Chapter 4.

Performance of Detailed Audit Tests and other Verification Procedures

Once the audit procedures have been developed and approved by the audit manager, the detailed field testing will begin. The testing will focus on:

- substantiation of the existence and effective operation of the controls listed on the Register of Essential Controls; and,

- verification of the significant weaknesses and deficiencies listed on the Summary of Control Weaknesses during the review and evaluation phases.

Verification normally involves the application of given audit procedures to a selected group of transactions/activities and is normally performed on a sample basis. The nature and extent of audit evidence required, which determines the level of testing to be employed, will itself depend on the level of materiality or significance of the issue under review and the level of assurance required to support audit findings.

Audit evidence is required to support audit conclusions and findings. What constitutes audit evidence will be determined in general terms by the nature of the audit engagement. For example, in function and organizational audit engagements, the evidence gathered must support, among other things, findings regarding the manner in which management responsibilities have been fulfilled. In this latter situation, audit evidence will often be persuasive rather than conclusive, and may be derived from interview and observation rather than by transaction testing and analysis.

Accordingly, testing methods will vary depending on:

- the nature of the activity being audited;
- the purpose of the test; and,
- the type of evidence available.

The auditor should always attempt to select testing methods which are appropriate to the environment, cost-effective and designed to give the level of coverage and assurance necessary to support audit findings.

A wide range of verification techniques is available to the auditor. Some of their principal features and applications are outlined as follows.

Sampling

When a population to be tested is too large to test 100 per cent in a cost-effective manner then some form of sampling will be employed.

Two broad categories of sampling are available: Non-statistical (often referred to as "Judgmental") and statistical. A detailed discussion of the advantages and disadvantages of each is beyond the scope of Part 1 and, in any case, this subject is well covered in a number of textbooks (see Bibliography for examples).

Whether statistical or non-statistical sampling is used, any representative selection will involve the following steps:

- definition of objectives;
- population definition;
- choice of degree of assurance;
- determination of sample extent;
- selection of sample items;
- verification of sample items;
- evaluation of sample results;
- conclusion.

Statistical Sampling

Statistical sampling is a rigorous tool for the systematic collection and mathematical evaluation of data. It involves the inspection and analysis of a portion of a population. Application of the laws of probability provides a predictable level of precision to, and confidence in, the sample information which can be related to (i.e. is representative of) the entire population. Statistical sampling is of particular value in arriving at a conclusion on the characteristics of large, generally homogeneous populations. The most widely used sampling applications are:

- attribute sampling, which answers the question of "how many?" and is used to determine the characteristics of a population in numerical terms; and,
- variable sampling, which answers the question "how much?" and is used to obtain the estimated monetary value of a population from a sample of that population.

Computer Assisted Audit Techniques

There are three major techniques which will be of use to the auditor:

- test packs, by which the auditor can ascertain whether the controls residing in the hardware and in the program are operating correctly;
- computer audit programs, which are written by, or for, the auditor to test the integrity of information produced by a particular system; and,
- continuous monitoring (sampling) hardware or software.

These applications require a good deal of expertise and considerable developmental effort where standard packs, or sampling software, are not available.

Analytical Review and Variance Analysis

Analytical review is the systematic analysis and comparison of related figures, trends and ratios used to identify their mutual consistency or inconsistency. Analytical review requires an inquiring mind and a good working knowledge of the audit entity. These will then be applied to financial or operating statements to determine the existence of logical relationships between known facts, estimates and budgets, corresponding data for previous years and the development of trends or variances. If unusual or unexpected trends, relationships or variances are identified, the auditor then will require plausible explanations or supporting evidence.

Independent or Third-party Confirmation

This technique is generally applicable to financial audits where external evidence is sought by the auditor to support account balances. However, it may have other applications to confirm the status of agreements, legal position under contracts or litigation, etc.

Other Techniques

A number of other specialized techniques may be considered by the auditor in particular situations and may include:

- correlation/regression analysis;
- time and motion study;
- linear programming;
- network analysis.

Whatever verification methods are used by the auditor, they must be designed to provide adequate and appropriate audit evidence relative to the operation of essential controls and the existence of significant control deficiencies and weaknesses and their cause and effect. (See Volume II, Part 2, Chapters 4 and 5 for further discussion of analysis techniques and audit evidence respectively.)

SECTION TWO: PRINCIPAL PRODUCTS

The principal products of the verification phase are:

- substantiation of essential controls (II.10)¹⁹;
- verification of significant control deficiencies, inefficiencies and weaknesses (II.10); and,
- verification of causes of deficiencies, inefficiencies and weaknesses, and of their effects on the auditees operations (II.10).

¹⁹ The numbers in parentheses refer to the components of the audit process as shown in Figure 3.

CHAPTER FIVE

REPORTING PHASE

INTRODUCTION

Reporting is the mechanism by which the auditor communicates findings, conclusions and recommendations to management to assist them in monitoring the economy, efficiency and effectiveness of internal management practices and controls, in improving the control framework and in ensuring adherence to established policies, plans and procedures. It is essential that the auditor develop the report for the appropriate audience. In certain situations, this may require various levels of reporting to be developed.

SECTION ONE: PRINCIPAL COMPONENTS

The principal components of the reporting phase are:

- presentation of audit findings to the auditee (III.1)²⁰;
- preparation of the audit report (III.2);
- presentation of audit findings to the Audit Committee (III.3); and,
- audit report follow-up (III.4).

Presentation of Audit Findings to the Auditee

There should be continuous dialogue between auditors and auditee management throughout the course of the audit assignment. There are, however, certain formal communication requirements, one of which is the requirement for the team leader to provide auditee management with a summary of audit findings and recommendations prior to drafting the final report. Responsibility for arranging and conducting such

20 The numbers in parentheses refer to the components of the audit phase as shown in Figure 3.

a debriefing rests with the team leader. In certain circumstances, it may be appropriate for the audit manager or even the director to be present at these debriefings.

The purposes of the exit interview are the following:

- to provide the auditor with an opportunity to ensure that all relevant facts related to the findings were considered. Accordingly, the auditor could obtain additional information or insight at this stage which was unavailable earlier and which could have a significant effect on the presentation and subsequent acceptability of the audit findings; also, as a result of any new information, there may be a need for further field work on specific items;
- to establish a firm base on which to write the audit report; after the exit review there may be disagreement on conclusions and recommendations, but there should be no disagreement or subsequent surprises on factual matters;
- to ensure that auditee managers have a thorough knowledge and understanding of the audit findings and of the conclusions and recommendations proposed by the auditor;
- to give auditee managers an opportunity to present information and opinions which may influence the auditor's conclusions, and allow the auditee managers the opportunity to suggest their own recommendations on how suggested improvements can be implemented and inform the auditor of action already taken; also, this process will afford auditee managers the opportunity to initiate corrective action immediately rather than waiting for the formal audit report; and,
- to provide a courteous conclusion to the audit and give the team leader a further opportunity to adjust, as necessary, the tone of the audit report; also, it can demonstrate to the auditee that the auditor is acting in a cooperative manner, rather than as an autonomous critic.

Once the team leader is satisfied that all working papers have been completed and reviewed and a summary of audit findings, conclusions, recommendations prepared, a meeting with the appropriate auditee management should be arranged before leaving the audit site. The team leader should address, as a minimum, the following matters during the exit interview:

- the purpose, scope and objectives of the audit;
- all significant audit findings, conclusions and recommendations to be incorporated in the report;
- acknowledgement of any difficulties or constraints experienced by the auditor in conducting the review;
- comments on matters already corrected; and,
- the cooperation extended during the audit.

If the discussions are conducted in a positive spirit, it is likely that auditee management will be disposed to act quickly to remedy observed deficiencies. Management views should be solicited and remedial action noted to ensure that the final audit report becomes a constructive mechanism for action.

Under certain circumstances, it may be appropriate to incorporate a visual presentation to senior levels of management as part of the exit debriefing. Such a presentation normally will be oral with various visual aids. Careful planning should precede such a presentation to ensure that audit findings which are appropriate to the level being debriefed are communicated logically, clearly and concisely.

It is a prerequisite of all exit meetings, debriefings or presentations that the team leader be clear as to the substance and tone of the final report.

Preparation of the Audit Report

The purpose of the audit report is to supply auditee managers with timely, accurate, concise and relevant information needed to initiate corrective actions.

Responsibility for preparation of the draft audit report should be shared by all persons engaged on the audit, with the various sections or elements of the report being developed by those auditors involved during the fieldwork, in the manner described in the evaluation phase. However, the team leader has overall responsibility for the preparation of the final report and for ensuring the quality and clarity of the final product.

There is no standard or universal model for the audit report. However, all reports should incorporate the following elements:

- an outline of the audit purpose, scope and objectives;
- a brief description of the audit approach followed;
- an overview of the audit entity in sufficient detail to convey that the auditor has gained a good general perception of the nature of the entity, and the environment in which it operates;
- a compendium of the major findings, conclusions and recommendations which states clearly the nature of the problem, the causes and the implications, and provides practical recommendations for action to be taken by each level of management, as necessary.
- responses from management to each of the findings; and,
- an executive summary.

In preparing the report, the team leader must ensure that the audit findings are adequately supported by evidence contained in the working papers. It is advisable that a working copy of the draft report be cross-referenced to the working papers to facilitate reference to the supporting evidence.

Finally, in preparing the report, the team leader must exercise judgment in the selection of issues to be covered. The report should include only relevant and significant information expressed logically and concisely, and addressed clearly to those who have the responsibility and authority for initiating corrective action. To accomplish this it may be necessary to provide more than one level of summarization and to supply excerpts to relevant peer managers (e.g. chief financial officer, personnel manager). The auditor's credibility can be seriously reduced by the inclusion of irrelevant or immaterial findings, or through a lack of clarity in assigning responsibility for the implementation of action plans; minor findings can always be conveyed to the auditee orally or in a management letter.

Presentation of Audit Findings to the Audit Committee

Arrangements for presenting audit results to Audit Committees vary considerably from organization to organization. In some cases each audit report is presented as it is completed; this allows the Audit Committee to participate in the disposition of recommendations, intervening, if considered necessary, at the action plan development stage, when such action is most effective and efficient. However, this mode of operation implies a frequency of Audit Committee meetings which some organizations may find too time consuming.

Audit Committees in other organizations are satisfied with a periodic summary of major findings, sometimes as infrequently as once a year in the internal audit head's Annual Report. This mode is less time consuming, but also less open to timely intervention in action plan decisions and monitoring of implementation. Also, this mode of operation obviously precludes debriefing of individual reports to the Audit Committee.

The recommended mode of operation is that frequency of Audit Committee meetings, and corresponding degree and nature of intervention, should be determined by the perceived need for such intervention.

Audit Report Follow-up

Having presented the report to auditee management the auditor has communicated to management deficiencies which, in the auditor's judgment, will expose management to material risks unless they are corrected. The prime responsibility for implementation of the corrective actions lies with the auditee management and not with the auditor. However, the auditor does have a responsibility to report on the progress of implementation of audit findings.

Once the audit report has been issued, the senior managers responsible for the unit audited should provide the internal audit group with a copy of the action plan developed for the implementation of recommendations contained in the report. This plan should contain implementation dates and should be submitted within a reasonable time following issuance of the audit report. (This requirement is often stipulated in the departmental Policy and Procedures Manual.)

Once the action plan has been received, the head of internal audit will normally assign an auditor the responsibility for follow-up on the implementation of auditee action plans. The follow-up will normally consist of:

- review of action plan;
- advice to the auditee on the suitability of the plan;
- advice to the deputy head and/or audit committee on the suitability of the plan, as appropriate; and
- periodic review of implementation progress (as directed by internal audit policy and/or the audit committee).

During the course of implementation, the auditor should monitor progress reports to the degree required by the deputy head (as advised by the audit committee). The auditor and audit manager will determine whether implementation of the action plan has been satisfactory, and where appropriate, report inadequate action.

Occasionally, the auditor may consider that a separate follow-up audit is warranted. In this situation, a detailed memorandum outlining the circumstances is prepared for the audit manager so that additional work may be included in the long-term plan. The audit may be included in the regular cycle or performed earlier, depending on the circumstances and, possibly, advice from the audit committee. The scope may consist of either the full scope of the audit or a scope limited to those areas with significant deficiencies.

As a minimum, the auditor should include corrective action as part of the scope of any future audits in the area.

(See Policy Interpretation Notice (PIN) 1983-03 for a more detailed treatment of Audit Follow-up.)

SECTION TWO: PRINCIPAL PRODUCTS

The principal products of the reporting phase are:

- an oral debriefing/presentation to the auditee;
- an audit report;
- a presentation to the Audit Committee;
- feedback to auditee managers and/or the Audit Committee on the adequacy of the action plan and implementation progress.

CONCLUSION

The audit process is a complex of concepts, procedures and relationships which is rarely linear in its form, logic or application. In conducting an internal audit assignment, the auditor is commonly faced with unfamiliar situations, several levels of interpersonal and organizational relationships and frequently with severe constraints on available resources and information availability. What this demands from the team leader, above all else, is the application of expert judgment, based upon wide and varied experience.

It is to this audience that the guidance provided in Part 1 is addressed and accordingly, is not intended to be exhaustive or prescriptive. It is a means of providing a framework within which users will evolve their own specific strategies for achieving their objectives and, consequently, it seeks to deal with the principal features of conducting internal audit assignments in a wide range of environments.

To achieve its objective of providing a reference point to auditors responsible for various types of internal audit assignments, Part 1 covers the major areas of the internal audit process in a generic manner and occasionally illustrates general themes with specific examples. Specific audit concepts and techniques are presented in Part 2 of Volume II of this Handbook.

It is not the intention that the Handbook serve audit team leaders as a procedural handbook for conducting audit engagements. Rather, its objectives will be achieved if it communicates clearly the complex and iterative nature of the audit process, the necessity of communication and collaboration between auditor and auditee, and the crucial importance of exercising professional judgment at all times. These themes, which recur throughout, are central to the successful conduct of any internal audit assignment. With a keen awareness of them, it is hoped that audit team leaders will find in the detail of Part 1 a useful point of reference in applying the audit process to specific assignments.

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ILLUSTRATION¹ OF RISK ANALYSIS FOR ASSIGNMENT PLANNING PURPOSES

Assume that we are planning an audit of a program delivery responsibility centre which has a manual program delivery process and is contemplating the possibility of automation.

According to the management information system (see Table 1) the cost per unit of output has been going up over the years, generally in proportion to inflation (essentially wage rates), however, we have also noted that in recent months the range of variability of the mean cost per unit has been increasing, while the upward trend in cost per unit has reversed itself (i.e. the most recent mean is lower than that justified by inflation).

The increases in variability and the trend reversal in the mean cost per unit have been discussed with management and the following relevant data were elicited:

1. The employees are aware that similar processes in the private sector are being automated and are, naturally, unsettled; morale is probably deteriorating.
2. Turn-over in staff has been increasing in recent months.
3. There has been a deterioration recently in the quality of time reporting.

1 The illustration presented here is a relatively complex example of risk assessment, which is justified only in equally complex resource allocation situations. An equivalent, purely judgmental, approach could be used in less complex situations. The judgmental approach is described in Volume I, Chapter 3 of the Internal Audit Handbook as well.

Table 1

Cost/Unit Data for the Previous
Five Years and for Recent Months

(a) Cost/unit in years 1980-1984

| <u>Year</u> | <u>Cost/Unit</u> |
|-------------|------------------|
| 1980 | \$100 |
| 1981 | \$110 |
| 1982 | \$125 |
| 1983 | \$130 |
| 1984 | \$135 |

(b) Cost/Unit in 1985

| <u>Month</u> | <u>Cost/Unit</u> |
|----------------|--------------------------------------|
| January | \$130 |
| February | \$125 |
| March | \$132 |
| April | \$120 |
| May | \$128 |
| June | \$121 |
| July | <u>\$119</u> |
| Mean cost/unit | <u>\$875</u> ÷ 7 = <u>\$125/unit</u> |

4. There seems to be no readily identifiable evidence of improvement in productivity; in fact, the increased turn-over should normally have decreased productivity.
5. Management is concerned that the most recent management information systems (MIS) data may be unreliable for purposes of decision-making as to whether automation would be cost-effective.

Management has estimated that the cost per unit obtainable through an automated program delivery system equivalent in capacity and producing the same quality of product as the present manual system would be \$130/unit; current volume is \$100 million units per year.

It may be seen from an analysis of the foregoing that it is crucial for management to validate their current MIS information before taking a decision to automate.

If their five-year trend is extrapolated, their cost/unit should be something over \$135/unit, in which case automation would produce an annual operating saving of \$5 million. This saving is clearly sufficient to recover the cost of the initial investment and provide an ample margin. However, if the productivity of the program delivery unit has indeed improved, perhaps due to fear driven increase in production per person, per hour, then investment in automation will produce a loss of \$5 million per annum plus the investment cost.

Given the high probability that the most recent cost/unit figures are not representative, it is likely that the manager would be willing to endorse a considerable expenditure on consultant or audit resources in order to remove the uncertainty.

The amount that the manager (organization) would be willing to spend would no doubt be somewhat less than the potential loss due to a wrong decision, but still substantial. In any case, in terms of allocation of scarce audit resources, if the audit manager were to perform similar analyses on other auditee areas competing for available audit resources, the final decision on audit resource allocation both between and within audit assignments would be greatly facilitated.

Appendix B

**ILLUSTRATION OF INDEXING/CROSS-REFERENCING
SYSTEM FOR WORKING PAPERS**

CURRENT WORKING PAPER FILES

| <u>Subject</u> | (1)* <u>Index</u> | <u>References to</u> | (2) <u>References from</u> |
|---|----------------------|----------------------|-------------------------------|
| <u>General/Administration (File 1)</u> | | | |
| Final Report; Final management letter | A | - | C, D, G |
| Management comments and action plans | B | A | source (3), C |
| Follow-up notes | C | B | source |
| Draft report; Draft management letter | D | A | E, G |
| Verbal debriefing - notes | E | D | source |
| Supervisory review checklists and notes | F | (4) | (4) |
| Summary of audit observations, conclusions and recommendations (including cause/ effect analysis) | G | A, D | J, K, L |
| Assignment Planning Memorandum | H | (5) | (5) |
| Correspondence | I | as necessary | source |

*For explanation of numbers see Explanatory Comments beginning on next page.

| <u>Subject</u> | (5) <u>Index</u> | <u>References to</u> | (1) <u>References from</u> |
|---|---------------------|----------------------|--|
| <u>Supporting Working Papers (File 2)</u> | | | |
| Register of Essential Controls | J | G | N, Q |
| Register of Compensating Controls | K | G | N, Q |
| Summary of Control Weaknesses | L | G | N, Q |
| Control Questionnaires | M | N | O |
| Documentation in response to control questionnaires | N | P | if conclusive - J, K, L if inconclusive - Q |
| Predetermined control model | O | M | source |
| Documentation of existing control framework | P | N | source |
| Verification plan, procedures, results | Q | J, K, L | N, source |

Explanatory Comments

- (1) Expansion of index - Each page of the section can be referenced simply as A1, A2, A3 etc., if a worksheet is to be added between A2 and A3, then A2 becomes A2.1 and the added sheet can be indexed A2.2.

- (2) References to
- Information contained in this section supports or provides background for the content of the section to which the reviewer is being referred.

- References from
- Information contained in this section is supported by the content of the section from which the reviewer is being referred.

For ease of review, working papers should be cross-referenced in a manner reflecting the relationships between sections as noted above. Working papers should build upwards from source data to the final audit report.

- (3) Source
- Indicates that information is derived directly from the audited entity through discussion, observation or application of audit procedures.
- (4) Supervisory review checklists
- Normally checklist is signed off indicating that a satisfactory standard of quality has been achieved in the audit and adequately reflected in the working papers.
- (5) Assignment planning memorandum
- Various aspects of the memo may be referenced to supporting working papers indicating to the reviewer that planning decisions and scope were taken into consideration during the conduct of the assignment.

PERMANENT WORKING PAPER FILES

| <u>Subject</u> | <u>Index</u> |
|---|--------------|
| <u>General Information</u> | AA |
| <ul style="list-style-type: none">• Significant legal, financial and regulatory constraints that have an impact on the audited entity.• Environmental information on organizations that affect the operations of the audited entity. | |
| <u>Operational Base for Audited Entity</u> | BB |
| <ul style="list-style-type: none">- Objectives of the auditee- Departmental and internal plans- Relevant policies and procedures- Reporting requirements- Services provided- Organization chart, position descriptions- Capital and operating budgets- Performance standards | |
| <u>Operational Documentation for Audited Entity</u> | CC |
| <ul style="list-style-type: none">- Systems documentation (program logic, management control framework, accountability relationships). | |
| <u>Previous Studies or Reports</u> | DD |
| <ul style="list-style-type: none">- Copies of previous audit reports, follow-up notes, management action plans, planning memorandum.- Copies of all recent AG reports, departmental responses. | |

Subject

Index

- Other internal departmental or central agency evaluation group studies or reports.

The foregoing list is meant to be illustrative and not restrictive in any way. Additional significant information should be included as necessary.

VERIFICATION PROGRAMS

| | |
|-----------|---|
| Program A | Controls Testing for Essential Controls |
| Program B | Controls Testing for Control Weakness |
| Program C | Substantive Testing |

**AUDIT PROGRAM - CONTRACTING FOR SERVICES
XYZ DEPARTMENT**

**CONTROLS TESTING
FOR ESSENTIAL CONTROLS**

Verification Objectives: Process Criterion 1

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff activities relating to TB guideline 1973-44 are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff activities relating to TB guideline 1973-44 are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

(initialled
by auditors) (Working
Paper
reference)

Select a sample (using statistical sampling techniques) of contracts for services processed during a test month of the current year.

For these contracts:

- 1) Examine the related contract checklist and determine:
 - a) that Part IV of the contract checklist was completed and signed off by the Director of Personnel Services;

Objective A (cont'd)

Done by W/P ref.

b) that Financial Services has ensured that
 Personnel Services reviewed the terms of the
 contract as evidenced by the completion of
 step 9(i) of Part V of the contract checklist.

- 2) Determine the nature and extent of information
 provided to the Director of Personnel Services for
 controlling staff activities in relation to TB guideline
 1973-44.

Assess whether the information provided a sufficient
basis for determining whether staff performed an
adequate review of the contract situation in relation
to TB guideline 1973-44 requirements.

- 3) Ensure that any deficiencies noted by the Director of
 Personnel Services were properly resolved on a timely
 basis.

(Where no deficiencies noted in sample, choose one
instance from other contracts for testing.)

Based on the above procedures conclude as to whether
control over staff activities relating to TB guideline 1973-
44 is operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by the Director of Personnel Services as follows:
 - a) Review the contract situation and determine whether Personnel Services staff obtained all necessary information and performed all procedures required by TB guideline 1973-44.
 - b) Through review of available documentation and discussion with staff, critically appraise the adequacy of the work performed by the Personnel Services staff in relation to the requirements of TB guideline 1973-44.
 - c) By reference to audit tests on the results relating to this process (see Verification Program - Results Criterion 1), determine whether any improvements in staff activities are required.

Follow up any deficiencies noted with the Director of Personnel Services. (Tests relate to determining effectiveness of control in meeting objective set for it.)

- 2) Determine the length of time required for the Director's review of the work performed by Personnel Services and investigate any unusual delays noted. (Test to ensure control is timely and involves minimal disruption to operations.)

Objective B (cont'd)

Done by W/P ref.

- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Text to ensure control procedures are cost-effective.)

Based on the above procedures conclude as to whether the control over staff activities conform to TB guideline 1973-44 is operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Results Criterion 1

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the control used to detect and correct contracting situations that have resulted in labour relations problems is operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the control used to detect and correct contracting situations that have resulted in labour relations problems is operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

- 1) Identify all labour relations problems which occurred during a test month. Determine through discussion with the staff responsible for dealing with the dispute whether the grievance was fully disclosed to the Director of Personnel Services.

Follow up any deficiencies noted.

- 2) Ensure that any items noted for corrective action by the Director of Personnel Services were followed up on a timely basis.

Based on the above procedures conclude as to whether the control used to detect and correct improper contracting situations is operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the test month selected, assess the effectiveness of the control procedures performed by the Director of Personnel Services as follows:
 - a) Review the nature of all labour relations problems that arose. Assess whether any of these problems may be attributed to a dispute as to whether work contracted-out should have been handled by Public Service employees. Where such a situation arose ensure that it was detected and subjected to appropriate corrective action by the Director of Personnel Services.
 - b) As part of any necessary corrective action, ensure that the Director examined that the method by which contracts are processed for any deficiencies which may have led to the labour problem. (Refer to Verification Program - Process Criterion 1.)
(Test to ensure control meets objective set for it.)
- 2) Determine the length of time required for the Director's review of labour relations problems and investigate any unusual delays noted. (Test to ensure control is timely and involves minimal disruption to operations.)

Objective B (cont'd)

Done by W/P ref.

- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective).

Based on the above procedures conclude as to whether the control for detecting and correcting labour relations problems relating to improper contracting situations is operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Process Criterion 2

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff reviews for employer-employee relations are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff reviews for employer-employee relations are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

Select a sample (using statistical sampling techniques) of contracts for services processed during a test month of the current year.

For these contracts:

- 1) Examine the related contract checklist and determine:
 - a) that Part III of the contract checklist was fully completed and signed by the responsibility centre manager;
 - b) that Financial Services has ensured that Legal Services reviewed the terms of the contract as evidenced by the completion of Step 9(i) of Part V of the contract checklist;
 - c) that Financial Services has signed off on their control review responsibilities as evidenced by the appropriate signature on Part V of the checklist.

Objective A (cont'd)

Done by W/P ref.

- 2) Determine what additional information was reviewed by Financial Services to ensure that Part III of the contract checklist was completed by the Manager in an appropriate manner.

Conclude on the adequacy of the information gathered for control purposes.

- 3) Examine the written legal opinion and ensure that the legal review seems reasonable covering all criteria noted in TB APM Chapter 312 article .3.3.
- 4) Ensure that any contract deficiencies noted by Financial Services or Legal Services were properly resolved before the contract was let.

(Where no deficiencies noted in sample, choose one instance from other contracts for testing.)

Based on the above procedures conclude as to whether the controls over staff reviews for employer-employee relationships are operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by Financial Services and Legal Services as follows:
 - a) Review the contract situation and determine whether responsibility centre managers obtained all necessary information and performed all procedures required by TB APM Chapter 312 article .3.3.
 - b) Through review of available documentation and discussion with staff, critically appraise the adequacy of the review performed by responsibility centre managers in relation to the requirements of TB APB Chapter 312, article .3.3.
 - c) By reference to audit tests on the results relating to this process (see Verification Program - Results Criterion 2), determine whether any improvements in staff activities are required.

Follow up any deficiencies noted with Financial Services.
(Tests relate to determining the effectiveness of control in meeting objective set for it.)

Objective B (cont'd)

Done by W/P ref.

2) Through inquiry of responsibility centre managers, determine:

- a) their satisfaction with the length of time required in finalizing contracts for services (test to ensure the timeliness of control).
- b) whether the review performed by Financial Services and Legal Services did not disrupt in any significant way the conduct of normal operations (test to ensure minimal disruption from control).
- c) whether they believe that the control review can be performed in a simpler or more timely manner (test to ensure control procedures are cost-effective).

Based on the above procedures conclude as to whether the controls over staff reviews for employer-employee relations are operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Process Criterion 3

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff activities required by TB guidelines 1971-64 and 1971-168 are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff activities required by TB guidelines 1971-64 and 1971-168 are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

Select a sample of the special or unusual contracts to which TB guideline 1971-64 and 1971-168 apply.

For these contracts:

- 1) Examine for Financial Services initialling of the responsibility centre manager's fee analysis as evidence of the control review.
- 2) Determine the nature and extent of information provided to Financial Service for controlling activities in relation to TB guidelines 1971-64 and 1971-168.

Assess whether the information provided a sufficient basis for determining the adequacy of the responsibility centre manager's analysis in relation to TB guidelines 1971-64 and 1971-168.

Objective A (cont'd)

Done by W/P ref.

- 3) Ensure that any deficiencies noted by Financial Services were properly resolved on a timely basis.

(Where no deficiencies noted in sample choose one instance from other contracts for testing.)

Based on the above procedures conclude as to whether control over staff activities relating to TB guidelines 1971-64 and 1971-168 is operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by Financial Services as follows:
 - a) Review the contract situation and determine whether the responsibility centre manager obtained all necessary information and performed all necessary tasks in relation to TB guidelines 1971-64 and 1971-168.
 - b) Through review of available documentation and discussion with staff, critically appraise the adequacy of the work performed by the responsibility centre manager in relation to TB guidelines 1971-64 and 1971-168.
 - c) By reference to audit tests on results relating to this process (see Verification Program - Results Criterion 3) determine whether any improvements in the manager's analyses are required.

Follow up any deficiencies noted with Financial Services.
(Tests relate to determining the effectiveness of control in meeting the objective set for it).

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted. (Test to ensure control is timely and involves minimal disruption to operations).

Objective B (cont'd)

Done by W/P ref.

- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective).

Based on the above procedures conclude as to whether the control over staff activities conform to TB guidelines 1971-64 and 1971-168 is operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Results Criterion 3

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over contract fees are reasonable in relation to TB guidelines 1971-64 and 1971-168 and operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over contract fees are reasonable in relation to TB guidelines 1971-64 and 1971-168 and operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

Using the contracts selected for testing for Process
Criterion 3:

- 1) Establish evidence which indicates that fees were subject to control review by the Financial Services Division.
- 2) Determine the nature and extent of information provided to Financial Services for assessing the reasonableness of fees in relation to TB guidelines 1971-64 and 1971-168.

Assess whether the information provided a sufficient basis for controlling contract fees.

- 3) Ensure that any deficiencies noted by Financial Services were properly resolved on a timely basis.

(Where no deficiencies noted in sample choose one instance from other controls for testing.)

Program A

Objective A (cont'd)

Done by W/P ref.

Based on the foregoing procedures conclude as to whether control over contract fees are reasonable in relation to TB guidelines 1971-64 and 1971-168 and operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by Financial Services as follows:
 - a) Review the contract situation and determine whether the responsibility centre manager considered all necessary factors in arriving at a contract fee.
 - b) Through review of available documentation and discussion with staff, critically appraise the reasonableness of the fees arrived at in relation to the requirements of TB guidelines 1971-64 and 1971-168.
 - c) As part of any necessary corrective action, ensure that Financial Services examined the method by which fees were determined as a possible cause for any deficiencies noted.

(Refer to Verification Program - Process Criterion 3.)

(Test to ensure control meets objective set for it.)

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted. (Test to ensure control timely and non-disruptive.)

Objective B (cont'd)

Done by W/P ref.

- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective.)

Based on the above procedures conclude as to whether the controls over contract fees are reasonable in relation to TB guidelines 1971-64 and 1971-168 and operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Process Criterion 4

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff analysis of the appropriate contract fee in relation to TB APB Chapter 312 article .4.3.9 are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over staff analysis of the appropriate contract fee are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

For the contracts previously selected:

- 1) Ensure that the following documentation was prepared by the responsibility centre manager and subject to control review by Financial Services:
 - the requirements of the task were outlined in Appendix D attached to contract checklist
 - qualifications of the individual are documented in a curriculum vitae
 - the composition of fees is outlined in Section 7 of the contract checklist
 - for competitive contracts, all tendering information for all bidders was provided to Financial Services.

Objective A (cont'd)

Done by W/P ref.

- 2) Ensure that any deficiencies noted by Financial Services in relation to the staff analysis of the appropriate contract fee was properly resolved on a timely basis.

Where none in sample, choose one example for testing.

Based on the above audit procedures conclude as to whether the controls over staff analysis of the appropriate contract fee are operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures by Financial Services as follows:
 - a) Review the contract situation and determine whether the responsibility centre manager obtained all necessary information and performed all required tasks in relation to article .4.3.9.
 - b) Through review of available documentation and discussion with staff, critically appraise the adequacy of the work performed by the responsibility centre manager.
 - c) By reference to audit tests on results relating to this process (see Verification Program - Results Criterion 4) determine whether any improvements in the manager's analysis are required.

Follow up any deficiencies noted with Financial Services.
(Tests relate to determining the effectiveness of control in meeting the objective set for it.)

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted. (Test to ensure control is timely and involves minimal disruption to operations.)
- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective.)

Objective B (cont'd)

Done by W/P ref.

Based on the above procedures conclude as to whether controls over staff analysis in relation to TB APB Chapter 312 article .4.3.9 are operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Results Criterion 4

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over contract fees are reasonable in relation to TB APB Chapter 312 article .4.3.9 and operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over contract fees are reasonable in relation to TB APB Chapter 312 article .4.3.9 and operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

Using the contracts selected for testing for Process
Criterion 4:

- 1) Establish evidence which indicates that fees were subject to control review by the Financial Services Division.
- 2) Determine the nature and extent of information provided to Financial Services for assessing the reasonableness of fees in relation to TB APB Chapter 312 article .4.3.9.

Assess whether the information provided a sufficient basis for controlling contract fees.

- 3) Ensure that any deficiencies noted by Financial Services were properly resolved on a timely basis.

(Where no deficiencies noted in sample choose one instance from other controls for testing.)

Objective A (cont'd)

Done by W/P ref.

Based on the above procedures conclude as to whether control over contract fees are reasonable in relation to TB APB Chapter 312 article .4.3.9 and operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by Financial Services as follows:
 - a) Review the contract situation and determine whether the responsibility centre manager considered all necessary factors in arriving at a contract fee.
 - b) Through review of available documentation and discussion with staff, critically appraise the reasonableness of the fees arrived at in relation to the requirements of TB APB Chapter 312 article .4.3.9.
 - c) As part of any necessary corrective action, ensure that Financial Services examined the method by which fees were determined as a possible cause for any deficiencies noted.

(Refer to Verification Program - Process Criterion 4.)

(Test to ensure control meets objective set for it.)

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted. (Test to ensure control timely and non-disruptive.)
- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective.)

Objective B (cont'd)

Done by W/P ref.

Based on the above procedures conclude as to whether the controls over contract fees are reasonable in relation to TB APB Chapter 312 article .4.3.9 and operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Results Criterion 5

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over the authorization of the total cost and time-rate fees reflected in contracts are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over authorization are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

- 1) Using the sample of contracts previously selected:
 - a) Examine the related contract checklist and ensure that Financial Services did a proper review for authorizations as evidenced by the completion of steps 9 and 12 of Part V of the contract checklist.
 - b) Examine signing authority cards held by Financial Services and ensure that they are current.
 - c) Where any deficiencies were noted by Financial Services in relation to authorizations ensure that they were properly resolved on a timely basis.

Based on the above procedures conclude as to whether the controls over contract authorizations are operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures performed by Financial Services as follows:
 - a) Examine the authorization made on the contract checklist and the contract. Ensure that appropriate authority was received given the total cost and time-rate fees involved in the contract.
 - b) Compare authorization made to the signing authority cards held by Financial Services.

Follow up any deficiencies with Financial Services.
(Tests relate to determining the effectiveness of control in meeting objective set for it.)

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted. (Test to ensure control is timely and involves minimal disruption to operations.)
- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective.)

Based on the above procedures conclude as to whether controls over contracts are properly approved are operating effectively.

State any reservations on a separate working paper.

Verification Objectives: Results Criterion 6

- A. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over TB submissions are operating as designed.
- B. To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the controls over TB submissions are operating effectively.

Auditing Procedures

Objective A

Done by W/P ref.

- 1) For the contracts previously selected:
 - a) Examine the related contract checklist and ensure that Financial Services did a proper review for the completion of a TB submission where required. Use Step 1 of Part V of the contract checklist as evidence of the control review.
 - b) Determine the nature and extent of information provided to Financial Services and assess whether it was adequate for control purposes.
 - c) Where any deficiencies were noted by Financial Services in relation to TB submissions ensure that they were resolved on a timely basis.

Based on the above procedures conclude as to whether the controls over TB submissions are operating as designed.

State any reservations on a separate working paper.

Objective B

Done by W/P ref.

- 1) For the contracts selected for testing, assess the effectiveness of the control procedures by Financial Services as follows:
 - a) Review the contract situation and determine whether the responsibility centre manager obtained all necessary information and performed all required tasks in preparing the TB submission.
 - b) Through review of the available documentation and discussion with staff, critically appraise the adequacy of the TB submission in relation to TB APB Chapter 312 article .4.3.7.

Follow up any deficiencies noted with Financial Services.
(Tests relate to determining the effectiveness of control in meeting the objective set for it.)

- 2) Determine the length of time required for Financial Services review and investigate any unusual delays noted (Test to ensure control is timely and involves minimal disruption to operations.)
- 3) Assess whether the control review can be performed in a simpler or more timely manner. (Test to ensure control procedures are cost-effective.)

Based on the above procedures conclude as to whether controls over TB submissions in relation to TB APB Chapter 312 article .4.3.7 are operating effectively.

State any reservations on a separate working paper.

**AUDIT PROGRAM - CONTRACTING FOR SERVICES
XYZ DEPARTMENT**

**CONTROLS TESTING
FOR CONTROL WEAKNESS**

Verification Objective:

To obtain sufficient, appropriate audit evidence relating to the likely cause and effects associated with the noted control deficiency to enable the determination of the nature and extent of substantive procedures required.

Auditing Procedures

Done by W/P ref.

- 1) Through inquiry with the auditee identify any reasons why control has not been established to detect and correct contracting situations that have resulted in employer-employee relations.

Consider, at least, the following possible causes:

- management did not recognize the need for control
 - cost/benefit factors
 - insufficient resources
-
- 2) Determine through inquiry with the auditee, the impact of the noted lack of control.
 - 3) Select a number of contracts for a test month.
Through discussion with responsibility centre staff and examination of available documentation attempt as far as possible to determine whether an employer-employee relationship was suggested by the actual contract situation.

Auditing Procedures (cont'd)

Done by W/P ref.

Based on the above procedures determine the nature and extent of substantive procedures required (consider your assessment of the adequacy of the related process criterion and the possible materiality of errors that may arise).

Verification Objective

To obtain sufficient, appropriate audit evidence relating to the likely cause and effects associated with the noted control deficiency to enable the determination of the nature and extent of substantive procedures required.

Auditing Procedures

Done by W/P ref.

- 1) Through inquiry with the auditee, identify any reasons why control has not been established over staff analyses of the appropriateness of fees for non-competitive contracts.

Consider, at least, the following possible causes:

- management did not recognize the need for control
- cost/benefit factors
- insufficient resources

- 2) Determine through inquiry with the auditee, the impact of the noted lack of control.

Consider, at least, the likelihood and magnitude of contract fees exceeding the going market rate.

- 3) Select a sample of non-competitive contracts for a test month. Assess the reasonableness of contract fees. This may be performed by comparing the fees with the "going rate" for a particular expertise. Information on such rates may be available from the department or agency or from other clients in the public and private sectors.

Auditing Procedures (cont'd)

Done by W/P ref.

Based on the above procedures determine the nature and extent of substantive procedures required (consider your assessment of the adequacy of the Manager's review and the possible materiality of errors that may arise).

**AUDIT PROGRAM - CONTRACTING FOR SERVICES
XYZ DEPARTMENT**

SUBSTANTIVE TESTING

Verification Objective: Process Criterion 1

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether staff activities comply to TB guideline 1973-44.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Select a limited sample of contracts from the entire period under review and perform the following tests:

- 1) Review the contracts generally and ensure that the relevant control procedures were applied; having established that the control was in place:
 - a) Review the contract situation and determine whether Personnel Services obtained all necessary information and performed all tasks required by TB guidelines 1973-44.
 - b) Through a review of available documentation and discussion with staff critically appraise the adequacy of the work performed by Personnel Services staff in relation to TB 1973-44.

Follow up any unusual items.

Auditing Procedures (cont'd)

Done by W/P ref.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of contracts from the entire period under review and perform steps a) and b) on previous page.

Based on the above procedures conclude whether staff activities comply to the requirements of TB guideline 1973-44.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 1

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether contracting situations do not result in labour relations problems.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Select a limited sample of labour relation grievances reported throughout the entire period under review and perform the following test:

- 1) Review the nature of the labour relations problem and assess whether it can be attributed to a dispute as to whether work contracted-out should have been handled by Public Service employees.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of labour relations problems and perform Step 1 above.

Based on the above procedures conclude whether contracting situations do not result in labour relations problems.

State any reservations on a separate working paper.

Verification Objective: Process Criterion 2

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether staff reviews for employer-employee relations are adequately performed before a contract for service is let.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample of contracts selected for Process Criterion 1 and perform the following tests:

- 1) Through review of available documentation and discussion with staff, critically appraise the adequacy of the review performed by responsibility centre managers in relation to the requirements of TB APB Chapter 312 article .3.3.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of contracts from the entire period under review and perform step 1 above.

Based on the above procedures conclude whether staff reviews for employer-employee relations are adequately performed before a contract for service is let.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 2

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether employer-employee relations are not established in contracts for services.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample of contracts selected for Process Criterion 1 and perform the following tests:

- 1) Through inquiry with auditee staff, review of contractor outputs and examination of any other evidence relating to the specific conduct and outputs of the contract under review, assess whether this information suggests the existence of employer-employee relations.

Follow up any unusual items.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of contracts from the entire period under review and perform step 1 above.

Based on the above procedures conclude whether employer-employee relations have not been established for contracts under review.

State any reservations on a separate working paper.

Verification Objective: Process Criterion 3

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether staff consider all factors involved in establishing a fee for contracts covered by TB guidelines 1971-64 and 1971-168.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Select a limited sample of special or unusual contracts covered by TB 1971-64 and 1971-168 from the entire period under review and perform the following tests:

- 1) Examine the documentation prepared in the establishment of a contract fee. Assess the adequacy of staff analysis of the contract fee in line with requirements of TB guidelines 1971-64 and 1971-168.

Follow up any deficiencies noted.

Where controls are missing or defined and the auditor cannot rely on them:

- 2) Select an extended sample of special or unusual contracts and perform step 1 above.

Based on the above procedures conclude as to whether staff activities conform to the requirements of TB guideline 1971-64 and 1971-168.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 3

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether contract fees are reasonable in relation to TB guidelines 1971-64 and 1971-168.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample selected for Process Criterion 3.
Perform the following test:

- 1) Critically appraise the reasonableness of contract fees. Use the criteria set out in TB guidelines 1971-64 and 1971-168 as a guide.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of special or unusual contracts from the entire period under review and perform step 1 above.

Based on the above procedures conclude whether contract fees are reasonable in relation to the requirements of TB guidelines 1971-64 and 1971-168.

State any reservations on a separate working papers.

Verification Objective: Process Criterion 4

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether staff consider all relevant factors in establishing the appropriate fee for each contract for services.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample of contracts selected for Process Criterion 1. Perform the following test:

- 1) Examine the documentation prepared in the establishment of an appropriate contract fee. Assess the adequacy of the staff analysis of the contract fee in line with the requirements set out in TB APM Chapter 312 article .4.3.9.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

Select an extended sample of contracts from the entire period under review and perform the following test:

- 2) Examine the documentation prepared or inquire as to other analysis performed in the establishment of an appropriate contract fee. Assess the adequacy of the staff analysis of the contract fee in line with the requirements set out in TB APM Chapter 312 article .4.3.9.

Auditing Procedures (con't)

Done by W/P ref.

Follow up any deficiencies noted.

Based on the above procedures conclude as to whether staff consider all relevant factors in establishing the appropriate fee for each contract for services.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 4

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether contract fees are reasonable in relation to TB APB Chapter 312 article .4.3.9.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample of contracts selected for Process Criterion 1. Perform the following test:

- 1) Critically appraise the reasonableness of the contract fees. Use the criteria set out in TB APB Chapter 312 article .4.3.9 as a guide.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

Select an extended sample of contracts from the entire period under review and perform step 1 above.

Based on the above procedures conclude whether contract fees are reasonable in relation to the requirements of TB APB Chapter 312 article .4.3.9.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 5

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the total cost and time-rate fees reflected in contracts for services are properly authorized.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Use the limited sample of contracts selected for Process Criterion 1. Perform the following test:

- 1) Examine the authorizations made on both the contract checklist and the contract. Ensure that appropriate authority was received, given the total cost and time-rate fees involved in the contract. Compare authorizations made to the signing authority cards held by the department.

Follow up any deficiencies noted.

Where controls are missing or deficient and the auditor cannot rely on them:

- 2) Select an extended sample of contracts from the entire period under review and perform step 1 above.

Based on the above procedures conclude as to whether the total cost and time-rate fees reflected in contracts for services are properly authorized.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 6

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether Treasury Board submissions include all necessary information.

Auditing Procedures

Done by W/P ref.

Where controls are effective and the auditor wishes to rely on them:

Select a limited sample of contracts requiring a TB submission from the entire period under review and perform the following tests:

- 1) ensure that Financial Services performed a control review as evidenced by the completion and signing off of Part V of the contract checklist;
- 2) having established the control was operating:
 - examine related TB submission and ensure that they include all information as outlined in TB APM Chapter 312 article .4.3.7.

Follow up unusual items.

Auditing Procedures (cont'd)

Done by W/P ref.

Where controls are missing or deficient and the auditor cannot rely on them:

- 3) Select an extended sample of contracts requiring TB submission from the entire period under review and perform step 2.

Based on the above procedures conclude as to whether TB submissions include all necessary information.

State any reservations on a separate working paper.

Verification Objective: Process Criterion 7

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether the auditee has undertaken an adequate study for ensuring that submissions to TB are made as efficiently as possible.

Auditing Procedures

Done by W/P ref.

- 1) Through discussion with the auditee determine the nature of any study performed for expediting the submissions to TB. Using the points made in TB APB Chapter 312 article .4.3.8 assess the adequacy of the study undertaken by the auditee.

Follow up any deficiencies noted.

Based on the above procedures conclude whether the auditee has undertaken an adequate study for ensuring that TB submissions are handled efficiently.

State any reservations on a separate working paper.

Verification Objective: Results Criterion 7

To obtain sufficient, appropriate audit evidence to enable a conclusion to be formed on whether TB submissions have been made efficiently.

Auditing Procedures

Done by W/P ref.

- 1) Selection an extended sample of TB submissions from the entire period under review. Assess whether submissions made could have been aggregated into an omnibus submission to improve efficiency.

Follow up any deficiencies noted.

Based on the above procedures conclude whether TB submissions are made in an efficient manner.

State any reservations on a separate working paper.

LOWE-MARTIN

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PART TWO: INTERNAL AUDIT CONCEPTS AND APPROACHES

CHAPTER ONE

INTERNAL AUDIT APPROACHES: OBJECTIVES AND LINES OF INQUIRY

INTRODUCTION

This chapter supplements Part 1 which deals with the internal audit assignment process. Specifically, this chapter elaborates the relationship between the purpose and scope of an audit assignment and the corresponding, detailed audit objectives and associated lines of inquiry.

As with audit purpose and scope, audit objectives and therefore lines of inquiry depend on the type of audit being undertaken and the subject matter of the specific audit unit being audited. Accordingly, Section One describes the relationship between purpose, scope, audit objectives and lines of inquiry for a number of typical types of audit that may be undertaken.

In undertaking an audit assignment there are general principles which apply in choosing an audit strategy. Some of these are enumerated and discussed in Section Two. Also, the trade-off between maximizing advice to management and efficiency in planning for and executing an audit assignment, or a series of assignments, is dealt with.

SECTION ONE: AUDIT OBJECTIVES AND LINES OF INQUIRY FOR TYPICAL TYPES OF AUDITS UNDERTAKEN

In this chapter, the purpose and scope for each type of audit will be carried forward from Part 1, Volume II, of this Handbook for the purpose of continuity. The object of this section is the establishment of a clear connection or bridge between purpose and scope on the one hand, and objectives and lines of inquiry on the other.

Each type of audit will be described in turn, including its particular purpose and scope, and the relationship between the general and specific purpose, scope and objectives for internal auditing.

The Standards¹, supplemented by Part 1, Volume II of this Handbook, provide generic purpose (role), scope and objectives for internal auditing (see Tables 1 and 2).

As is the case for purpose and scope, the specific objectives set and lines of inquiry chosen for any particular internal audit assignment depend on the type of audit undertaken (i.e. Responsibility Centre (RC) Audit, Organization Audit, Function Audit, Systems Audit, Special Audit). However, in the case of objectives, and even more so for lines of inquiry, two other factors determine their extent and nature. These are the subject matter of the audit (e.g. program or activity, function, system) and its context (e.g. centralized or decentralized, volatile or stable, material or high risk, or non-material or low risk).

The audit purpose and scope statements indicate why an internal audit is undertaken and where. The audit objectives state what performance the auditor wishes to assess. Finally, lines of inquiry delineate how the assessment is going to be carried out.

1 Standards for Internal Audit in the Government of Canada, Treasury Board of Canada, Office of the Comptroller General, 1982.

Table 1

Purpose and Scope of Internal Auditing

(A) Purpose (Role) of Internal Auditing

"Departments shall have an independent internal audit function that carries out a systematic review and appraisal of all departmental operations for purposes of advising management as to the efficiency, economy and effectiveness of internal management policies, practices and controls."²

(B) Scope of Internal Auditing

"The scope of internal audit shall encompass all aspects of a department's operations. The internal auditor assesses and expresses an opinion upon:

- the design, development, implementation and operation of all systems, procedures, processes and controls, including computer-based systems;
- the reliability and adequacy of information available for decision-making and for accountability purposes;
- the extent to which available information is utilized in the decision-making process;
- the adequacy of protection afforded public funds and assets; and
- the extent of compliance with legislative, central agency and departmental direction."²

2 Ibid, p. 4.

Table 2

General Internal Audit Objectives

(C) Audit Objectives

"The objectives of internal auditing include assessing:

- the integrity of financial and other information;
- the adequacy of controls over public property, revenues and expenditures;
- the degree of compliance with objectives, policies, plans, procedures, laws and regulations; and
- the extent to which there is management with due regard for economy, efficiency and effectiveness."³

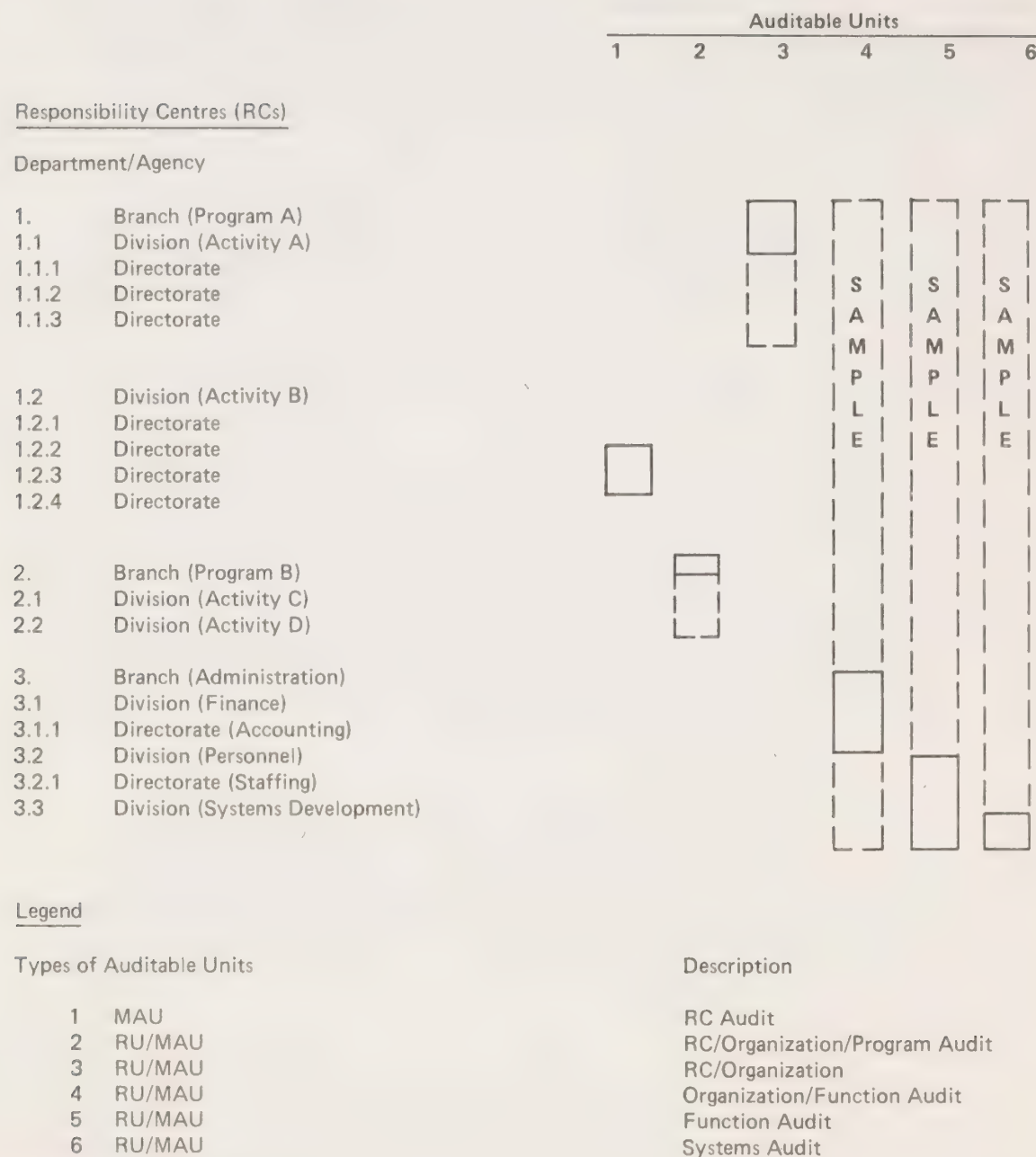
In the broadest terms, the objectives of the internal auditor are to assess the performance of the audit unit to determine whether required results are being achieved, i.e. that the unit is economic, efficient and effective; and that those results will continue to be achieved in the future, i.e. that the delivery system is performing as intended and is likely to continue to do so. This assessment is generally made through the auditee's control framework.

Lines of inquiry are chosen so that the purpose of the audit is fulfilled over the range of activities desired while meeting the specific objectives of the audit and doing this efficiently.

In deciding on lines of inquiry, the following general conditions should be kept in mind:

- With the exception of special audits and those cases where controls are known to be non-existent or weak, it is usually more efficient to audit the performance of controls rather than audit the operations and results directly. Moreover, where controls are sound, it is efficient to rely on them, thus minimizing the time-consuming and costly substantive testing that would otherwise have to be performed.
- Although management and staff are distinct, in terms of role, it is generally more efficient to audit organizational arrangements (e.g. organization structure, job descriptions, delegation documents) as one structure rather than as two. That is, it is more efficient to treat them as a single line of inquiry.
- Although results objectives (i.e. economy, efficiency and effectiveness) are generally associated with management and operations outputs with the delivery process (i.e. input, process, output), the controls for them may overlap.
- Where policies, directives, procedures, etc. do not exist for an activity (e.g. where the activity is rarely performed, straightforward, non-standard or it is not cost-effective to develop direction for it) the delivery system process controls will be those for management's organizing/leadership process. These are generally the least documented.

ILLUSTRATION OF MANAGEABLE AUDIT UNITS IN TERMS OF TYPES OF AUDITS



MAU = Manageable Audit Unit
RU = Reportable Unit

Figure 1

Responsibility Centre Audit

A responsibility centre (RC) audit consists of an audit of all the important activities undertaken by that RC (whether the RC be program, administrative or a combination of the two, e.g. a region), the management of that RC, and the impact of functional direction (e.g. program policies, personnel policy, financial policy) on the activities of that RC.

Columns 1 and 2 of Figure 1 represent responsibility centres which are considered significant. They are, however, not necessarily both reportable and manageable audit units. That is, they are manageable as individual audit assignments but may, or may not, be worth reporting to senior management on their own merits (i.e. Reportable Units).

In this situation the major auditee is senior management. Derivative auditees would be immediate and intermediate management and functional groups which impinge on the responsibility centre. Column 1 of Figure 1 represents a responsibility centre audit which may not be, by itself, sufficiently significant to report to senior management. In this case, it would probably be rolled up, or grouped, with other similar manageable audit units for reporting to senior management as part of a reporting audit unit, but would be reported on, as is, to local management.

The purpose statement for RC audits is derived from the general purpose statement in the Standards. It delineates which type of operation will be examined and assessed. It may be stated as follows:

Purpose: This responsibility centre (RC) audit is undertaken for the purpose of providing management with advice on the performance of all the important activities undertaken by this RC, its management, and the impact of functional direction on its activities.

When a specific RC is identified as the subject of the audit, its title and/or number may be substituted wherever "RC" occurs.

The scope statement is derived from the general scope statement (see the Standards)⁴; the details are only filled in when the specific RC to be audited is identified. Its opening paragraph might read as follows:

Scope: The scope of this RC audit encompasses all aspects of the RC which fall within its organizational boundaries. It is recognized, however, that substantive testing activity may require the auditor to obtain data from outside the RC (i.e. the environment). Specifically, the scope of this audit includes:

It is not expected that every element of the generic scope statement will be applicable to every specific audit.

Audit Objectives: A responsibility centre (RC) is an auditable unit that contains two distinct elements as objects of auditors' attention. One element is the delivery system which includes organization structure, policies and procedures, processing and associated information systems (both line and functional) along with their respective operating controls. The second element is the management system which includes the management structure, management process and associated management controls. In generic terms these elements include:

1. Delivery System

1.1 To assess the performance of the delivery system's static elements:

- (i) organization structure and associated elements (e.g. job descriptions, delegation documents),
- (ii) operating systems, policies and procedures, etc.

⁴ Ibid, p. 4.

1.2 To assess the performance of the delivery system's dynamic elements:

- (i) processing of goods or services,
- (ii) operating output or results.

2. Management System

2.1 To assess the performance of the management system's static elements:

- (i) management structure and associated elements (e.g. job descriptions, delegation documents),
- (ii) management systems, plans, policies and procedures, etc.

2.2 To assess the performance of the management system's dynamic elements:

- (i) planning, organizing, leading, controlling, communicating,
- (ii) organizational (RC) outputs or results: economy, efficiency and effectiveness.

Lines of Inquiry: As in most audits, the general approach will be to assess the control framework and rely on its feedback, to the degree possible, in deciding on the extent of substantive testing required. Accordingly, the lines of inquiry in a typical RC audit will include these elements.

1. Delivery System/Management System

1.1 Assess the organizational control framework, including:

- organization structure
- span of control (e.g. adequacy of supervision)
- reporting relationship
- job descriptions

- delegation documents
- assignment of responsibilities (e.g. separation of duties)
- performance review.

1.2 Assess delivery process controls
(based on major or significant RC activities).

1.3 Assess relevant administration process controls:

- financial
- personnel
- administrative (EDP, materiel, property, etc.)
- other.

1.4 Assess management process controls:
(use Guide to an Audit of the Management Process)

- planning
- organizing (those not covered in 1.1)
 - (a) development of required delivery system
 - (b) operation of the delivery system
- leading
- controlling
- communicating.

2. Results

2.1 Assess delivery system output controls (specific, depend on the particular RC's activities).

2.2 Assess management results controls:
(specific, depend on the particular RC)

- economy
- efficiency
- effectiveness.

Organization Audit

Organization audits are RC audits where more than one, or parts of more than one, RC are involved (e.g. a division, branch, a region, an airport, a ship) (see Column 3 of Figure 1). In these cases, significance would normally be assigned to the highest-level RC which would therefore become the reporting unit as far as senior management is concerned. The key distinction between a responsibility centre audit and an organization audit is that an organization audit will typically include, for example, a number of regional offices within a branch or a number of local offices within a region.

Intermediate- and primary-level line managers would receive summary reports (management letters) or complete reports, depending on which of them is considered to be the appropriate level to take desired corrective actions. A similar strategy would be applicable to peer-level managers who provide functional direction, advice, or service to management in the audit unit.

Purpose: This organization audit is undertaken for the purpose of providing management with advice on the performance of a group of responsibility centres, or parts of responsibility centres and on the impact of functional direction on their activities.

Scope: The scope is determined by the combined boundaries of the RCs, or parts of RCs, included in the audit unit. It is recognized, however, that substantive testing activity may require the auditors to obtain data from outside the audit unit.

Audit Objectives: Since the organization audit is essentially a responsibility centre type of audit involving more than one, or parts of more than one, responsibility centre, its objectives are identical to those for RC audit except for complexity.

The complexity of an organization audit derives from the usually hierarchical nature of organizations. When auditing a RC which has several subordinate RCs with complex operations (i.e. several interrelated activities), complexity for the auditor arises not only from the complex operations but from the fact that to any level of RC higher than the first level, the operations include both the lower-level RCs and

their management. That is, the auditor has to consider both the integrated process and the integrated results of the lower-level RCs in developing audit objectives. (See Figure 2 for a pictorial representation of this concept, and the associated discussions in Section Three of Chapter 2⁵ and Section Two of Chapter 3⁶.)

Lines of Inquiry: As in the case of audit objectives, lines of inquiry for organization audits are similar to that of an RC audit with one variation. In the case of many homogeneous RCs working under a higher-level RC (e.g. several regions reporting to a general manager, ADM, or VP of regional operations, or several local offices reporting to a regional manager) a statistical approach to audit evidence gathering may be adopted. In these cases, data from a few of the regional or local RCs are gathered and used to represent all RC's of the same type.

Function Audits

A function RC (e.g. finance, personnel, or a group providing functional direction to a program) is one which provides functional direction, advice, and sometimes services to other RCs within the organization. Generally, direction is provided through the issue of formal policies and directives and other similar mechanisms. The function audit must include review of the effectiveness, efficiency and economy of the direction or service being provided by the functional group and the extent of adherence to its policies. To avoid duplication, the audit may be accomplished by reviewing pertinent information from recently completed RC or organization audits. Column 5 of Figure 1 illustrates a function audit of the personnel function, while Column 4 illustrates a combined organization-function audit, since it includes an audit of branch management as well as of the financial function.

5 Internal Audit Handbook, Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors".

6 Internal Audit Handbook, Volume II, Part 2, Chapter 3, "Management Control: Concepts and Practices".

MODELLING, USING THE TECHNIQUE OF PROGRESSIVE ELABORATION

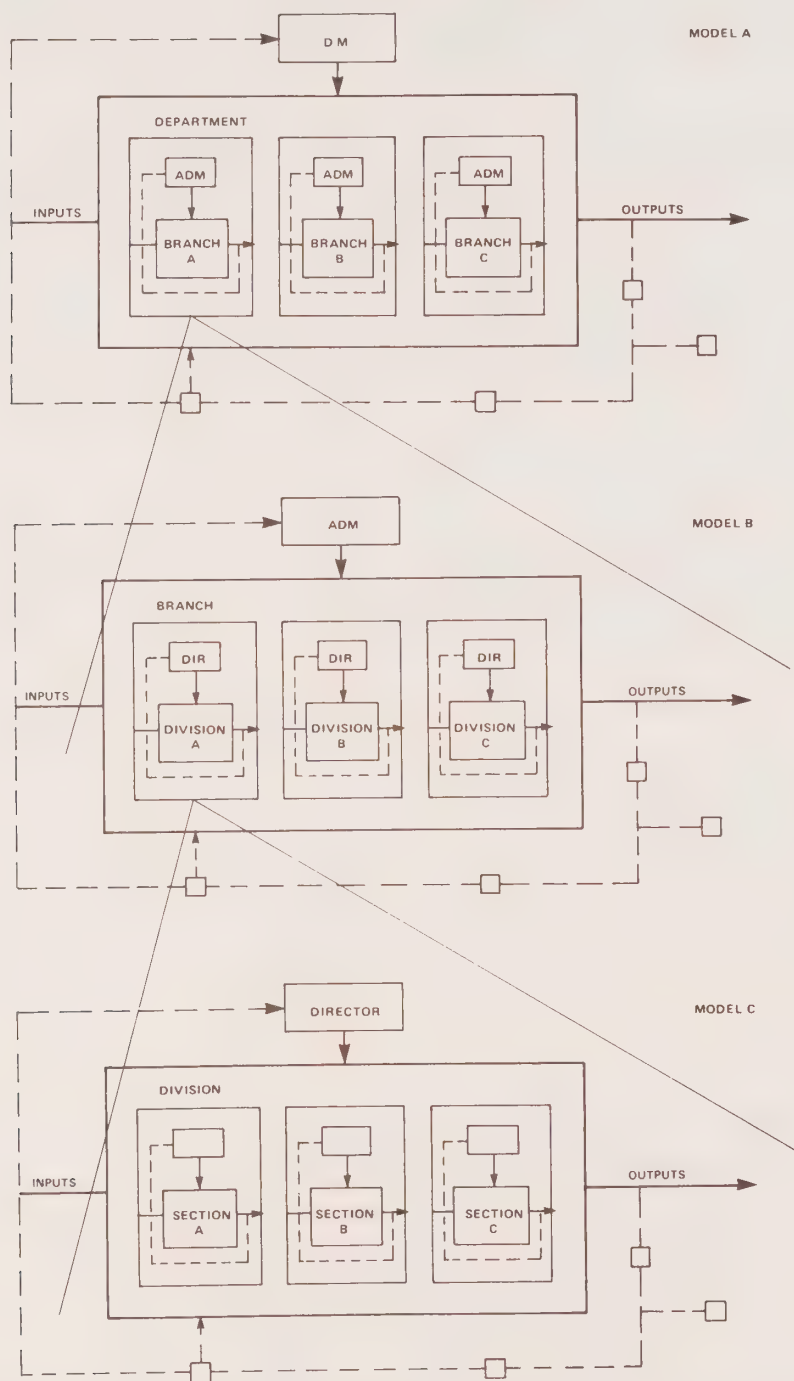


Figure 2

For a function audit, the major client, in addition to the Deputy Head, is the head of the function subject to audit. He or she is also the main auditee. Derivative auditees are other, lower-level groups within that function and the selected RC managers that were part of the sample.

Purpose: This audit provides advice to management on an organizational unit which provides functional direction advice and/or services to other organizational units and includes both program and support (finance, administration, personnel, official languages, etc.) functional activities. This functional direction will usually be provided through the provision of formal policies, directives, systems and procedures and other similar direction and advice or services.

Scope: Function audits are usually performed on two levels:

- Audit of the organizational unit which is the source of functional direction (the scope of this part of the audit is similar to that of an organization or RC audit); and
- Audit of adherence to policy and directives and use of advice, systems and procedures by the organizational units which are subjected to functional direction, and of the effect of that direction, advice or service on those units (the scope here is all the organization's units that are subject to the direction, advice or service provided).

Audit Objectives:

- Audit of the RC or organization providing the functional direction, advice or service. This part of the audit will have objectives similar to that of an organization or RC audit with special emphasis on controls which enable managers to determine the degree to which their direction, advice or service is having the desired effect; and
- Audit of RCs or organizations which are subject to the functional direction, advice or service in question (i.e. recipient RCs or organizations). The audit objective here is to assess the performance of

functional directives, advice or services in the context of the needs of the recipient RC or organization. Direction, advice or service provided will not be of equal relevance or usefulness to all RCs or organizations; lines of inquiry and audit criteria will have to be adjusted accordingly for each audit assignment.

Lines of Inquiry:

- Audit of the originating RC or organization: similar to any RC or organization audit, whichever is more representative of the functional group's organization structure,
- Audit of recipient RCs or organizations: in deciding on the audit approach for this part of the audit, decisions will have to be made as to which elements of functional direction, advice or service are relevant and their relative significance to the various RCs in the auditee organization. Those considered both relevant and significant should be included in recipient RC audits.

Relevant evidence may be obtained from RCs in a number of ways:

- (i) through 100 per cent audit of all recipient RCs;
- (ii) through an audit of a sample of recipient RCs; or
- (iii) by accumulating relevant evidence from RC or organization audits performed for other purposes, provided they were performed within a reasonable time frame prior to the function audit in question, such that the evidence is not considered stale (i.e. not representative of the current state of the recipient RC).

It is, of course, necessary to include appropriate scope, objectives and lines of inquiry adjustments in the audit assignment plans of those RC or organization audits that are intended to provide dual purpose results as proposed in (ii) and (iii).

Program Audits

A program audit is a responsibility centre audit of the RC or RCs charged with the overall responsibility for the program or activity (e.g. a branch) and, where applicable, an audit of all or a sample of the program-related operations of the responsibility centres (e.g. regions, local offices) involved in the delivery of the program.

Depending on how program delivery is organized, a program audit may resemble an organization audit, a responsibility centre audit or a function audit. Column 2 of Figure 1 illustrates a program audit. It should be noted that RC 2 (in Figure 1, Column 2), which has overall responsibility for the program, is audited as a responsibility centre audit. Although it would be possible to audit only specific program activities in this RC, the administrative and management practices within this RC would be expected to affect overall program performance. It is therefore considered desirable to audit this type of RC in its entirety as part of a program audit.

A complication occurs when auditing a regional or local office which delivers more than one program from or through a common administrative framework. Here a similar audit strategy to that outlined in the foregoing discussion may be employed (for example, an audit of a large RC with several activities and its own administrative services).

Purpose: This audit provides advice to management on the performance of a program or sub-program (activity) in terms of its delivery system and results.

Scope: The scope of this audit includes, at the minimum, the delivery system of the program or activity and its management. Other elements that may be included, depending on how program delivery is organized are:

- the RC or organization providing functional (policy) direction; and
- regional or local offices which participate in the delivery of the program in whole, or in part (program under audit only).

Audit Objectives: Audit objectives for a program audit may resemble those of an RC audit, organization audit or function audit depending on how program delivery is organized (see the three previous audit objectives sections). Particular attention should be given to the existence of program effectiveness controls (i.e. managerial controls and program evaluation).

Lines of Inquiry: As with audit objectives, the lines of inquiry depend on how program delivery is organized. They will also depend on audit strategy.

Audit strategy decisions can occur at several levels. At the head office level, where more than one program or activity is being managed there is a decision to be made whether only the program or activity under audit will be included in the assignment or whether the opportunity will be used to provide feedback to management on the whole RC. This situation is more likely to occur where a sub-program or activity is being audited.

Similar decisions need to be made where program delivery is through a number of regional or local offices. The options to consider include:

- (i) audit 100 per cent of the RCs that act as the delivery vehicle for the program under audit, even though they may be delivering other programs as well;
- (ii) audit a sample of RCs that deliver the program under audit:
 - (a) 100 per cent
 - (b) desired program only;
- (iii) audit only that portion of the RCs that deliver the program under audit;
or
- (iv) rely on audits of RCs which were performed as RC audits or as program audits of other programs, which were completed within a sufficiently short time frame that the data are still current.

Systems Audit

Although the term "systems audit", if one were to take the most generic definition of the word "system", would include all types of audit units already described, the term as used here includes only systems in the narrower sense as used by EDP or systems and procedures staff.

A systems audit is an audit of a system used by any functional or line (i.e. program) unit, or any combination of the two.

Column 6, Figure 1 provides an illustrative example of this type of auditable unit, where the Systems Development Division is the host unit.

Purpose: To provide management with advice on the performance of a user information system, usually EDP-based.

Scope: This type of audit is similar in nature to the functional audit in that it is carried out by performing:

- (i) a review of the organizational unit which is responsible for the overall design, development and maintenance of the system (the administering unit, typically the EDP group);
- (ii) a review of the organizational unit which hosts (owns), as well as uses, the system; and
- (iii) a review of the users of the system, if they are not the owners.

Note: It is possible for the first two, or all three, to be the same organizational unit.

Audit Objectives: In a systems audit the auditor, typically, is not auditing complete responsibility centres, but rather parts of them. However, the general controls applicable to all activities in an RC should be reviewed.

The general objectives for a systems audit would include those that the auditor would use in a functional audit, remembering that the relevant static and dynamic elements of the delivery system may be spread over more than one organizational unit (e.g. the EDP and the financial services groups, and RC managers or financial officers, in the case of a financial reporting system).

Specifically, audit objectives could include:

1. Delivery System

1.1 To assess the performance of the delivery system's static elements:

- (i) organization of the developer, custodian, host, or users of the system, including organization structure, job descriptions, delegation documents, quality of personnel, separation of duties, security, training, etc.;
- (ii) operating and maintenance systems, policies and procedures (including manual procedures, computer programs, users manuals, maintenance manuals, etc.);
- (iii) environmental or general controls (including security, data integrity, operating system hardware, software or storage controls, development or maintenance process controls, etc.).

1.2 To assess the performance of the delivery system's dynamic elements:

- (i) processing of transactions;
- (ii) operating outputs or results.

2. Management System

Note: Unless the system is large enough to warrant a full-time manager (i.e. being treated as an RC) this section would not be required, but where it is large enough to be treated as an RC, the RC audit objectives apply.

Lines of Inquiry: As indicated in the audit objectives section, the auditor's attention should be directed to three areas of activity; namely, the developer, maintainer or custodian of the system, the host or owner of the system and the users of the system. These areas may not be organizationally distinct, depending on the nature of the information system under audit. Accordingly, specific lines of inquiry may include the following:

1. Audit of the developer, maintainer or custodian of the system: several organizational arrangements for this activity are possible:

1.1 Systems Development Function/RC

If systems development is expected to be an on-going activity the department will likely have established a permanent systems and procedures function or RC. If most of the systems development activity is EDP-based, and is sufficiently extensive, then it will likely be an EDP systems development group situated in an organizationally distinct informatics group or computation centre, otherwise it may be in the administration branch. The two possibilities are, of course, not mutually exclusive.

Given a distinct group for systems development, the audit will consist of an RC or organization audit with the delivery system being a systems development structure and process for which there is central agency guidance, likely supplemented by departmental guidance as well.

1.2 System development is one activity of the host organization. In this case an organization or RC audit is carried out of the host organization where at least three delivery system elements will be of interest:

- (i) the development activity and its supporting structure;
- (ii) the owner activity that provides direction for, and depends on, the information system under audit; and
- (iii) the general, relevant organization structure and processes, common to some or all activities, that support both of the foregoing activities.

1.3 Systems development is a minor activity of the host or user group.

In this case, whether the systems development delivery system is audited as a distinct entity or not will depend on its materiality or significance.

In cases where systems development is audited as one of several activities in an organization or RC it will usually be more efficient to audit the complete host RC and carry forward findings which are not related to systems development for reporting separately, or to incorporate them in reports on adjacent audited entities.

2. Audit of the owner, host organization or RC

The owner or host organization is generally the organization unit that developed the system, including the user specifications, and continues to provide guidance on its use: use, that is, of output as opposed to technical operating instructions, which are usually provided by the developers. It is also usually a major, if not the major, user. It will generally be the most important auditee in determining the economy, efficiency and effectiveness of an information system.

In this case, audit of the management system will usually take the form of an organization or RC audit. Audit of the delivery system will depend on whether the information system is the main delivery system of that organization or RC, an input to the main delivery system, or a support information system for administrative decision-making (e.g. in support of financial, personnel decisions).

In the case of a main delivery system, the audit becomes a program audit, unless the host or owner is a functional group. In the latter case it becomes part of a function audit.

If the information system is not a main delivery system, but an important input to one, the strategy may be to perform the audit in conjunction with the delivery system it feeds. Whether the audit is done individually or separately will depend on the relative materiality or significance of the respective systems involved and on the degree of interdependence. A support information system will usually be best audited as an element of the organization or RC that it supports.

3. Audit of the User of the System

Situations where the user is also the developer or owner of the system have been already dealt with. Where the users are neither developer nor owner, they are typically many and dispersed. Audit of their use of the system will generally be very similar in nature to an audit of the recipients of guidance in a functional audit, i.e. the audit will either be:

- 3.1 an already scheduled organization or RC audit of which an element is use of the system under audit. In this case the findings regarding use of the system are relayed to the audit team carrying out the systems audit;
- 3.2 an audit of all the RCs that use the system, but only those activities or structures in the organization or RC that relate to use of the system; or

- 3.3 an audit, similar to that described in 3.2 but of a sample of users: this is feasible since the audit, being an audit of a system, will necessarily have homogeneous elements and the main feedback path for the audit will be to the owner or host managers.

Where the users of the system are outside the host organization of the internal audit group, the audit group will have to coordinate its activities with the program evaluation function.

Pre-implementation Audit

Pre-implementation audit is an audit of proposed legislation, policies, systems, contracts, etc.

These audits are concerned generally with the degree to which the mechanism under design will exhibit post-implementation manageability and auditability, and specifically with the adequacy of controls being built into the proposed mechanism. They are performed at various points during the specification, development, design, implementation, and turnover process, when the cost-effectiveness of such a review is highest. A second type of review that may be included in the audit scope at this time is an audit of the development process itself. This latter type of audit has already been dealt with in the previous discussion (Systems Audit).

Purpose: The purpose of pre-implementation audits is to audit major systems to assess the adequacy of controls being designed into the systems in question, prior to their implementation.

Scope: The scope of pre-implementation audit includes major new or revised legislation, policies and procedures, information systems, program delivery systems, contracts, etc. As with audits of operating systems, covered in the foregoing discussion, systems under design involve participation of developers, owners and users. The perspective of the audit must take the control needs of all these participants into account.

Audit Objectives: The objectives of a pre-implementation audit are to assess the adequacy of controls being designed into the system from the perspective of all stakeholders (i.e. developers, maintainers or custodians, owners or hosts and users), keeping in mind materiality and significance considerations. In essence, a pre-implementation audit is a systems audit, as described above, except that it is performed before it is put into effect. Also, it does not normally include assessment of systems development structures or processes nor owner or user delivery systems - unless the system under development is the delivery system. On the other hand, relevant general or environmental controls usually will be assessed.

Lines of Inquiry: The audit will generally focus on the activities of the systems development team since the system is a concept on paper, rather than a physical system. However, as indicated in the discussion of audit objectives, the control needs of all stakeholders will have to be assessed.

It is not uncommon for an audit of the systems development group (organization or RC) to include the pre-implementation audit of one or more systems under development as a sub-component of the more extensive organization or RC audit.

Special Audits

This type of audit is usually for the purpose of reporting on an issue that does not fit readily into a manageable audit unit. It would include unscheduled audits requested by senior management, unexpected audits caused by some fraud or defalcation incident, etc., as well as scheduled, issue-oriented audits.

Purpose: The special audit is usually performed at the request of management, normally to deal with unforeseen situations, policy developments or other senior management concerns, including suspected fraud or defalcation.

Scope: The scope of a special audit depends on the situation. It is typically narrow and executed in a comparatively short time frame.

Audit Objectives: The objectives of a special audit are situation dependent and cannot be generically stated.

Lines of Inquiry: Since the purpose, scope and objectives are situation dependent, the approaches to be used cannot be generically stated.

SECTION TWO: AUDIT ASSIGNMENT STRATEGY

In Section One, generic audit objectives and associated lines of inquiry were presented for the various types of audits that an audit group is likely to undertake.

An analysis of the lines of inquiry will reveal that when the various types of audits are scheduled in a long-term plan and annual schedule there is likely to be considerable duplication if the scope of individual assignments is not adjusted to remove or at least minimize it.

In this section various possible strategies will be discussed for choosing the types of audits to perform in any one time frame and the possible adjustments in scope, objectives and lines of inquiry that might be made which would satisfy the requirements of avoiding unnecessary duplication while ensuring adequate coverage of the audit universe and specific managerial concerns.

In planning for adequate audit universe coverage, over a three- to five-year period, two of the first concerns are to determine:

- which of the organization's units or elements are major and significant to management; and
- what combination of types of audit (e.g. RC, program, function, system, special) will result in appropriate, meaningful and timely feedback to management.

In this respect, some general principles may be adopted as a starting point.

- The definition of the terms "major" and "significant" are to be arrived at jointly with senior management.
- What is considered major or significant may change over time. The audit group must recognize this in developing audit plans.

- The type of audit chosen should best reflect the nature of the activity that the main auditee is managing (e.g. functional direction, program delivery) in order that useful feedback to management be optimized.
- The type of audit chosen should respond to management's expressed concerns.
- The scheduling of audit fieldwork should result in a minimum of disruption of the auditee's environment, in terms of both frequency of interruption and length of time per interruption.
- Presentation of reports to management must be timely, in terms of the currency of the data on which the findings and conclusions are based and in terms of management's decision cycles.
- The choice of audit strategy should result in efficient use of audit resources (i.e. the use of audit resources for results achieved should be optimized).

Definition of Major and Significant

In the Standards⁷, the terms major and significant are used in the context of "All major systems, functions and organizational units performing significant responsibilities should be examined within a period not exceeding three to five years."

Since the purpose of internal audit is to provide advice to management, clearly the definition of what is major and significant must be determined in the light of management's perception of the relative importance of its various organizational elements and associated responsibilities.

7 Standard No. 3, Standards for Internal Audit in the Government of Canada, Treasury Board of Canada, (Office of the Comptroller General), 1982.

The term major is usually dependent on significance and significance is usually determined in terms of risk of deviation in actual as opposed to desired performance which may result in a material or significant loss of resources or unacceptable program output or effects.

Although, ideally, management would like reassurance that all its organizational elements are performing satisfactorily and that risk of loss is minimized, resources are limited. Therefore, there are some organizational elements for which control activity (managerial control and/or internal audit) will not be cost-justifiable. For this reason what is considered major or significant will depend on a trade-off between the risk of loss or non-performance and cost of controls.

As organizational objectives and priorities change, the definition of major organizational units and significant responsibilities will necessarily change accordingly, while still subject to resource constraints.

Choice of Audit Types

In deciding which type of audit will best provide the desired audit universe coverage, "optimization of advice to management" may again be used as a criterion. The type of audit chosen should be such that it answers all of the auditee manager's significant questions in the most efficient manner. Efficiency, then, is the second criterion. Efficiency in this case has two aspects: assignment level efficiency and overall operations level efficiency.

The interaction of the "advice to management" and "efficiency" criteria may best be illustrated by the following example.

All organizations have staff (functional) and line (program, product, service delivery) organizational units.

Suppose we are planning to audit one functional unit, say finance, and several program delivery responsibility centres.

The preferred audit type for auditing a functional organization unit is a function audit. This type of audit typically includes an organization or RC audit of the organization's units that provide the functional advice, direction, services and an audit of a sample, or all, of the organizational units or RCs that are subject to the advice, direction and services provided.

If the function audit is scheduled and performed without regard for any line or program organizational unit audits that may be planned for the same time frame, it is likely that many organization units will either be visited twice in the same general time frame (say a year) or, worse still, simultaneously by two different audit teams. Thus it may be readily seen that an approach which maximizes advice to the functional manager may result in inefficient use of audit and auditee resources. Clearly a trade-off is called for, one of optimization of the two criteria rather than maximization of either.

An alternative strategy is to perform the organization or RC audits for both functional and program managers independently but with provision for sharing relevant results both ways. That is, results of program-based audits that involve findings pertaining to advice, direction and services provided by the functional group would be passed on to the function audit team while the results of those program delivery organizational units that were in the function audit sample but were not planned for audit in the same time frame would be passed on to the program audit team.

This may involve altering the scope of some of the audits in order to accommodate the needs of both teams. However, the result is that the "advice to management" and "efficiency" criteria are optimized; i.e. the best results possible are provided for management while meeting cost constraints and, incidentally, minimizing annoyances to management which may or may not have cost implications.

There are two main limitations to this strategy. The first is currency of data. That is, results from one audit will only be useable by another audit team if the data upon which the audit findings are based are still valid. The second is audit perspective. Although the scope of a program audit may be changed to provide

needed feedback to a function audit team, the perspective will still be, or should be, that of the program manager and that of the functional manager, for the reverse situation.

This is possibly less of a limitation than it seems. Often a program manager goes overboard in depreciating the importance of central direction while the reverse is also true: i.e. functional managers often overemphasize the importance of functional direction.

The auditor is in an ideal position to balance the relative importance of both, thus providing a more balanced opinion from the point of view of the head of the whole organization - the ultimate client, the Deputy Head.

CONCLUSION

In conclusion, a natural extension of the audit purpose and scope statements for audit assignments, discussed in Part 1, is detailed audit objectives and associated lines of inquiry.

As is the case with purpose and scope, audit objectives and lines of inquiry are determined by the type of audit being undertaken and the nature and scope of the audit unit being audited. Beyond this, audit objectives and lines of inquiry may also be influenced by specific management concerns.

In Section One of this chapter, general audit objectives and lines of inquiry have been presented for a number of the more typical types of audits that an audit group may undertake. In each case, subject- and situation-specific adjustments would have to be made in order to have a complete set of either audit objectives or lines of inquiry for any specific audit assignment.

In Section Two, audit assignment strategy was discussed, some general principles which may be useful in deciding on such strategy were presented and criteria for choosing between audit types were enumerated. In particular, the trade-off between maximizing advice to management and efficiency was stressed.

In general, this chapter supplements the discussion of the audit assignment process introduced in Part 1 and specifically rounds out the areas related to subject- and situation-specific aspects of audit assignment planning and execution.

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CHAPTER TWO

CONTROL: CONCEPTS AND APPLICATIONS FOR INTERNAL AUDITORS

INTRODUCTION

Public concern over the size, complexity and cost of government activities has placed increased emphasis upon the importance of adequate managerial control in the federal government. The importance of proper control derives from the public service's obligation to render to Parliament a full accounting for the carrying out of its assigned responsibilities and for its stewardship of the resources entrusted to it. The ability of public sector managers to account for their activities requires that they have a means of directing, monitoring and redirecting performance in each of their delegated areas. To this end, managers must establish adequate systems of control.

The recent change in the nature, scope and purpose of internal auditing in the federal government places the audit profession in a unique position for providing aid to management in achieving improved control. Internal auditors are currently expected to possess a fundamental understanding of control theory and be capable of commenting on its proper application to organizational settings. The Standards for Internal Audit indicate that the role of federal government internal auditors is "to review, evaluate and report on the adequacy of the ...control framework... to examine and evaluate performance in relation to this framework and to report the extent of compliance to management". The Institute of Internal Auditors has stated that "internal auditing is to assist members of the organization in the effective discharge of their responsibilities by providing them with information regarding control".¹ Internal audit as the "control of controls" is considered to be an essential tool of management, providing a service through its independent review and evaluation of the economy, efficiency and effectiveness of other controls.

1 The Institute of Internal Auditors, Statement on Internal Auditing Standards No. 1, Control: Concepts and Responsibilities, Institute of Internal Auditors, 1984.

Despite the significance of the concept of control to the federal government in general and the internal audit community in particular, there still exists considerable ambiguity in the actual use of the term control. This may be the result of inadequate thought about control in conceptual terms. Perceptions relating to control are often restricted to the applied aspects of the subject with attention centred upon the various physical devices, or process steps, considered necessary to achieve control. Too seldom is control discussed in terms which define its fundamental purposes, elements, functions and relationships to the entity subject to control.

Recent publications, such as Principles for the Management of the Public Service of Canada (see Bibliography at the end of this chapter), move managers and internal auditors towards a clearer definition of control; however a greater in-depth understanding of the subject is still required. Managers require a basic understanding of the subject to ensure that an appropriate design and application of controls occurs within the government. Internal auditors must possess a proper conceptual understanding of control if they are to effectively fulfil their redefined role as the organization's control advisers. Meaningful and valid audit results will be consistently achieved only when broad-scope auditing is fully reconciled to the valid conceptual basis offered by control theory.

In addressing the need for a valid conceptual basis, this document discusses systems and control theories both in general terms and as they are applied to audit assignments. In Section One, an overview of the internal audit function is given with a demonstration of where systems modelling techniques and control theory can contribute to the conduct of the audit assignment.

Having shown the usefulness of systems and control concepts, Section Two focuses on the core knowledge auditors should have relating to these subjects. The reader should recognize that this section involves discussion of a number of abstract ideas which initially may be difficult to follow because they do not specifically address the applied aspects of auditing.

The significance of these generic concepts will become apparent in Section Three. Here, the document shows how organizational activities can be modelled, and the auditor's evaluative criteria developed, using the systems and control concepts developed in Section Two. Section Four demonstrates how the descriptive and prescriptive models are then used by the auditor to evaluate controls. Included in this discussion is the integration of the suggested audit approach provided in this document with the conventional work instruments associated with audit assignments. Specifically, a brief reconciliation is given between the use of the Internal Control Questionnaire, the Audit Verification Program and the prescribed audit approach. It is hoped that this structure illustrates not only a practical approach to the conduct of audits, but also represents a methodology which is based on a firm conceptual understanding of control.

Management is responsible for the identification of the need for and the development, implementation and operation of the control framework. Accordingly, Chapter 3, "Management Control: Concepts and Practices", deals with these aspects of control and should be read in conjunction with this chapter.

SECTION ONE: INTERNAL AUDIT AND CONTROL THEORY

The Controls Approach to Internal Audit

In general, internal auditing in the federal government is a function whose purpose is to arrive at certain conclusions concerning the condition of the resources, processes and results of the entity under review. Specifically, the Standards for Internal Audit expect the auditor to determine whether:

- systems, procedures and controls are adequately designed and developed, and that they are operating efficiently and effectively;
- adequate information is available for decision-making and accountability purposes;
- available information is properly utilized in the decision-making process;
- public funds and assets are adequately protected; and
- legislative, central agency and departmental directives are being complied with.

Internal auditors usually do not attempt to assess directly the operations and results of the entity under review to determine whether the above conditions exist; rather they evaluate the adequacy of the control framework established by management to achieve these conditions. Essentially, the control framework serves as a proxy measure for determining whether the desired conditions actually exist. Where the auditor determines that the control framework is effective, the underlying inference is that the entity under review likely achieves satisfactory operating conditions. For example, consider the auditor's task of concluding whether the level of efficiency found in a system under review is adequate. The auditor's tests of the control framework will not give a full appreciation of the system's actual efficiency but will give assurance that management is doing everything practical to ensure that

desired levels of efficiency are achieved. Using tests of the control system, the auditor can conclude that there is reasonable assurance that the operations are achieving an adequate level of efficiency.

To evaluate the adequacy of the auditee's control framework, the auditor must perform two tasks. First, the auditor must develop a sound understanding of the actual processes and controls subject to review. Second, criteria must be determined which will form the basis of the auditor's evaluation.

In essence, auditing involves the comparison of the actual conditions of the auditee operations as determined by the auditor with the evaluative criteria that have been established for the assignment. The audit report should identify those areas where actual auditee conditions either conform or deviate from the desired conditions represented by the evaluative criteria.

While simple in conceptual terms, the actual development of an accurate understanding of the auditee's operations and the creation of evaluative criteria are complex tasks. The major portion of the balance of this document is directed at providing the theory and techniques required by auditors to complete these tasks.

The Development of Audit Models

Models are of particular importance to analysts of all types of organizations. Faced with a confusing array of facts, analysts use models to bring order to their understanding of the entity under review. In auditing, models are useful not only in bringing order to the auditors' study of the auditee, but also as a means for communicating their understanding and basis of evaluation to other auditors, auditees and audit report recipients.

The theory and techniques that an auditor can use to develop both a descriptive model of the entity under review ("what is") and a prescriptive model containing the audit assignment's basis of evaluation ("what should be") is explored here.

In the development of a descriptive model, this document emphasizes the usefulness of systems modelling techniques and control theory in characterizing the auditee's key structures, processes and controls.

The prescriptive audit model sets out the basis on which an auditor will evaluate the adequacy of the auditee's controls. As described, the prescriptive model must at least establish the auditor's expectations in terms of what controls are essential, what objectives they should serve and how the controls should be designed. The development of this model must also rely heavily on a sound knowledge of control theory.

Summary

A sound knowledge of control theory is essential to auditors as it provides the basis for their evaluation of the adequacy of the auditee's operations. An orderly evaluation of complex auditee operations is facilitated through the auditor's use of descriptive and prescriptive models which are based on systems modelling techniques incorporating control theory principles. The balance of this chapter is devoted to developing the auditor's understanding of systems techniques and control theory so that the above approach to audit evaluation can be achieved. Section Two will provide the basic knowledge requirements of systems modelling and control theory; Section Three will then demonstrate the application of these techniques and theory in the audit process.

SECTION TWO: SYSTEMS MODELLING AND CONTROL THEORY

This section of the chapter is divided into two parts. In the first part, discussion centres on systems theory and modelling techniques which should help auditors build descriptive models of the entity subject to audit. The second part reviews basic control theory principles borrowed from the physical sciences and cybernetics. Employing the concepts of systems modelling, control is presented as a particular type of system having a unique kind of purpose and structure. This information provides the basis of building control features into the auditor's descriptive model of the audited entity. An understanding of the purpose of controls and how they should be designed will also form the core knowledge that an auditor should employ when building the prescriptive model used to evaluate the adequacy of the auditee's operations.

The discussion in this section is conceptual; demonstration of the usefulness of the material covered here is reserved for Section Three. Throughout the text of Section Two, summary statements relating to systems and control are highlighted for the reader's attention. These statements provide in concise form the key concepts that form the basis for the control model put forward.

Systems Concepts

What is a System?

A system is defined as a set of elements related to one another according to some coherent pattern. While the elements are important, it is the linkages or relationships among the elements, defined in terms of a common purpose, which make it possible to speak of a system. The elements of a system and their relationships have attributes or properties such as size, shape, function, velocity or rate. It is the relationships however that account for the systemic nature of phenomena rather than the attributes themselves.²

2 White, Michael J., et al, Managing Public Systems: Analytic Techniques for Public Administration, North Scituate: Duxbury Press, 1980, p. 21.

Basic to systems is the idea of purpose. Coherent patterning associated with the elements of a system implies the existence of meaningful relationships. Relationships become meaningful when linked with a common purpose. Without knowledge of purpose, an observer would not be able to distinguish the elements and relationships relevant to a system; the boundaries of the system could not be determined and there would be no awareness of structure.³

Elements included within a system can form relationships of varying strength. The strength of relatedness between elements is determined by the degree to which their interaction contributes to the achievement of the system's overall purpose. Many variables interact to contribute to the attainment of a particular system's purpose. The model builder, however, makes conscious choices as to which relationships are most significant in explaining the process through which a purpose is achieved. Proper selection of system elements and relationships in a model allows for a useful representation of reality while avoiding the costs associated with unnecessary detail.

- **Summary Statement: Entities which exhibit purpose can be described using systems techniques.**

Basic System Features⁴

The basic system features can be represented as shown in Figure 1. Although specification of a system includes elements, relationships and their respective attributes, we need several more descriptive concepts.

The first thing one should notice about the systems diagram is the introduction of the terms input, process, output and feedback. Inputs are the start-up force that provides the system with its operating necessities, be they demands for products

3 Beer, Stafford, The Heart of Enterprise, Chichester, New York, Brisbane and Toronto: John Wiley & Sons, 1979, pp. 7-9.

4 Schoderbek, Peter P., Kefalas, Asterios G., and Schoderbek, Charles G., Management Systems Conceptual Considerations, Dallas: Business Publications, Inc. 1975, pp. 30-37.

SYSTEM CONCEPTS⁴

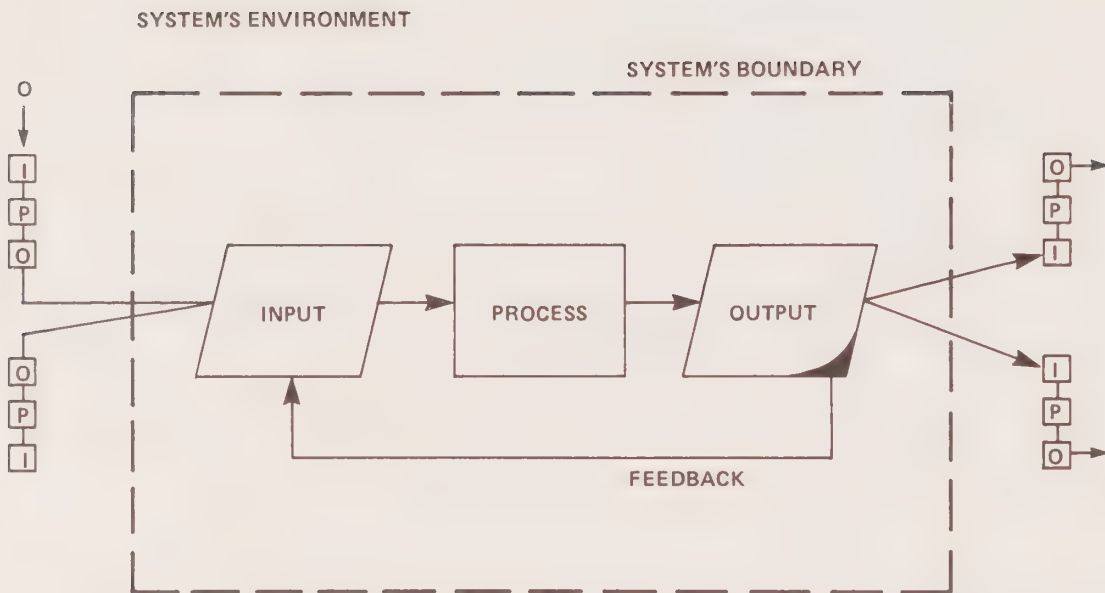


Figure 1

⁴ Schoderbek, Peter P., Kefalas, Asterios G., and Schoderbek, Charles G. Management Systems Conceptual Considerations, Dallas: Business Publications, Inc. 1975, pp. 30-37.

and services or resources such as material, energy, humans or information. Inputs can be the outputs of other systems or be a reintroduction of a portion of the output of the same system. This latter type of input, called feedback, will be discussed shortly.

Process is that which transforms the input to an output. In some situations, the process by which inputs are transformed into outputs is not known in detail because this transformation is too complex. Observers of such systems can only make inferences about the nature of the input-to-output conversion process.

Outputs, like inputs, generally take the form of products, services, information or energy. The output of one system becomes the input of another system. The succeeding system may represent a new cycle of the process which just created the output or may be a new process.

Feedback is a systems component which ensures that the desired state of the system is maintained or attained. Without feedback, a system would not have the information to determine whether actual performance compares favourably with desired ends or whether the means to desired ends, or process, will continue to perform as expected. Feedback represents the control function of a system and establishes the basis from which our control model will be subsequently derived.

Each of these system concepts will be re-examined in Section Three. The nature of inputs, processes, outputs, and feedback in organizations will be reviewed to provide auditors with a basis for creating a descriptive model of the processes subject to audit.

Environment of a System

One should also notice that Figure 1 identifies a system's boundary and a system's environment. Every system has something internal and external to it. An environment is external to a system but affects the system's behaviour. The behaviour of the environment can be influenced by the system, but cannot be controlled by it.

A method proposed for the determination of a system's environment is to pose certain questions as illustrated in Figure 2. The first question is whether the item under observation is relevant given the system's objectives. If the item is not relevant to the system being modelled, then it is neither included in the descriptions of the system nor its environment. If the item is relevant, however, then the second question is asked to determine whether the item is also subject to the control of the system. Where the item is controllable it is systemic, where it is uncontrollable it is environmental.

IDENTIFICATION OF SYSTEMIC OR ENVIRONMENTAL FACTORS⁵

| | | Is the item under observation relevant to the system's objectives? | |
|---|-----|--|---|
| | | YES | NO |
| Is the item under observation controllable by the system? | YES | Item is included as part of the system | Item is neither part of the system nor its environment (e.g. not included in systems model) |
| | NO | Item is included as part of the system's environment | |

Figure 2

As will be discussed in Section Three, one of the strengths associated with the systems approach is its direct recognition of environmental factors which influence system's behaviour. Understanding environmental influences will often provide clues as to the causes behind certain aspects of the system's behaviour.

For auditors, specific recognition of environmental influences is an important aspect of their analysis. In many cases, auditee actions represent responses to environmental influences. Any audit model which does not consider the auditee's operations within the context of its larger environment risks losing a significant portion of its power to explain auditee behaviour.

⁵ Schoderbek et al, op. cit., pp. 39-41.

Boundary Problems

The boundary of a system depends upon the observer's viewpoint as to the nature and purpose of the system. Once these have been specified, the facts that are relevant to the observer's conceptualization become fixed and a boundary separating controllable from uncontrollable factors can be drawn.

When a number of observers are analyzing a system, the boundary may be established through conventional agreement. Otherwise, given the possible differing perspectives of the observers as to the nature and purpose of various phenomena, there is a danger that no common systemic framework will be derived.⁶

Determining boundaries is an important aspect of the auditor's descriptive model as they establish which activities should be subject to the auditor's direct examination. Differences in opinion between the auditor and auditee as to which activities or elements are controllable and relevant to the auditee's operations should be subject to particular scrutiny. In many audits, these differences in opinion may reveal important problems concerning the auditee's perception of jurisdictional boundaries within the organization.

Levels of Systems⁷

The input - process - output diagram of Figure 1 may represent a model of a whole system or only part of a larger system. When clusters of elements within a system are related by a common purpose they comprise a sub-system which follow some or all of the same norms of behaviour as found in the larger system.

Having identified a collection of elements, relationships and sub-systems as a system, the system's environment can be examined. It may be found that the system under investigation can be viewed itself as but a component of a larger collection of elements and relationships sharing common purposes and affected in common by

6 Beer, op. cit., pp. 9-10.

7 White et al, op. cit., pp. 26-27.

each other and wider events. This wider collection of units and relationships that form part of the system's environment may be termed for convenience as the supra-system.

The terms sub-system, system and supra-system are applied according to the observer's (or auditor's) level of interest at a particular moment. These terms are illustrated in Figure 3.

Open versus Closed Systems

The classification of systems into open and closed categories rests upon the concepts of boundaries and inputs. Resource inputs over which categories the system has control are, by previous discussion, within the boundary of the system. Uncontrolled inputs are part of the environment.⁸

In an open system, uncontrolled inputs are accepted by the system and may influence its future behaviour. In a closed system, uncontrolled inputs are not accepted and as such cannot influence the systems behaviour.

For the auditor, knowing whether a system tends to be more open or closed may help in determining whether a system is properly designed and operated to accommodate the demands of its environment. Where a more closed system exists in a rapidly changing environment, the auditor may be concerned about the continuing effectiveness of the system. With a lessened ability to accept new environmental information, there is a danger that the system will not respond appropriately to changing environmental needs and constraints. Contrastingly, where a system is overly receptive to environmental information which has limited bearing upon the system's effectiveness, the auditor may be concerned about the system's efficiency.

Adaptive versus Corrective Systems

Adaptability is a system's ability to alter its processes so as to produce the kinds of outputs required for continued survival in its environment. The learning capability is the key characteristic of adaptive systems. They may respond to requirements

8 Schoderbek et al, op. cit., pp. 45-46.

SUPRASYSTEM, SYSTEM AND SUBSYSTEM

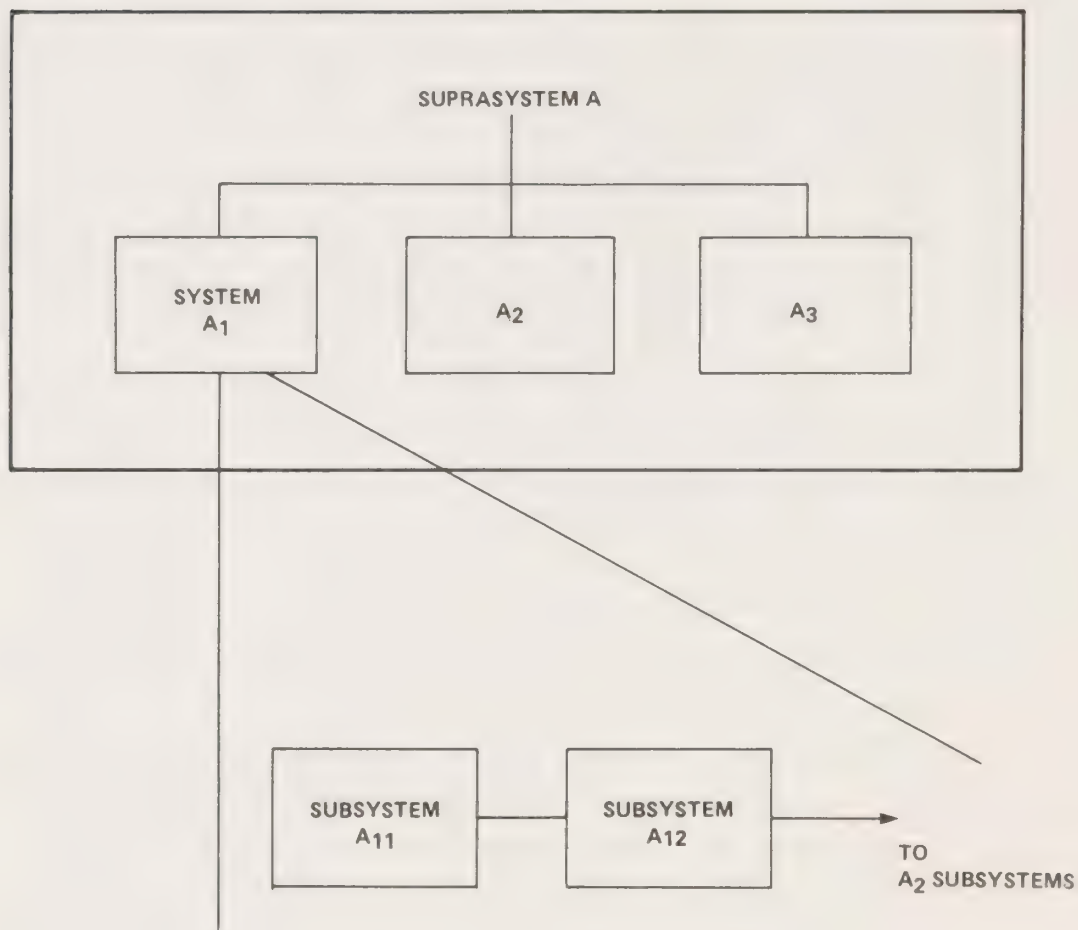


Figure 3

for changed outputs in unprogrammed or non-routine ways. Adaptive systems must be open. Identification of a need to alter systemic behaviour to produce desired outputs is dependent upon receipt of environmental information.⁹

The nature of adaptive systems can be compared and contrasted against the characteristics of corrective systems. Like adaptive systems, a corrective system may be open to environmental information and be capable of detecting changes in it.

Corrective systems can also adjust their processes and outputs in response to the detected environmental changes. Unlike adaptive systems however, the corrective system has no learning capability. Corrective systems can only respond according to predetermined rules and do not have the flexibility to adjust those rules.

Auditors are concerned with the degree of flexibility with which a system can react to changed environmental conditions. In certain situations, where the environment is relatively unchanging or changing in predictable ways, it may be more efficient to program a system to respond in a fixed manner to certain environmental conditions. On the other hand, where an environment is constantly changing, the system may need to be very adaptive to remain effective and responsive to environmental requirements.

Summary

Systems theory is often seen as a strategy for inquiry, a way of thinking. As a model, systems theory provides a way of seeing. In the following part, we will be developing a model of control using systems theory and incorporating the concepts presented in this section from the specific perspective of control systems. As will be shown in Section Three, the descriptive model of the auditee developed by auditors may be designed using control system modelling techniques.

Control Systems

The word control has been used with such a variety of meanings in audit and management literature that it has achieved a high level of ambiguity. Control is often described in terms of its manifestation as a physical device (i.e. wage and

⁹ Schoderbek et al, op. cit., pp. 47-48.

price controls), a step in a process (i.e. regulating, directing), or as a particular end result and condition (i.e. "in control", "under control"). While some attention is given to the purpose of these devices and procedures, a rigorous treatment of the concept of control is not available.

One of the reasons for the focusing of attention on control applications is due to the dominating influence of private sector external audit literature and research on the audit community as a whole. In external auditing, evaluation of financial accounting controls is performed to determine whether the accounting system can be relied upon to generate financial data in accordance with generally accepted accounting principles. Where reliance on the system of internal control can be justified, the auditor may reduce the extent of testing that must be performed to substantiate any opinions expressed on the fair presentation of financial reports. Evaluation of financial accounting control has been aided by the development of a number of generally acceptable control practices which can be used as a template by auditors during their evaluation. Since standard practices exist, attention paid to controls tends to be oriented towards the application side of the accounting control model as opposed to the underlying concepts involved.

In the practice of management and in internal auditing, controls are examined in a much broader context than strictly financial accounting control. While some of the financial control principles used in external audit evaluations are helpful to internal auditors, additional control criteria are required to meet the internal auditor's needs in evaluating managerial and organizational activities. These criteria must be even more extensive for public sector internal auditors who are concerned with the adequacy of controls over not only the economic results of the organization but social results as well. Instead of focusing on the numerous control applications that can be found in the public sector, internal auditors must strive to first obtain a fundamental understanding of the purposes of control and the elements and activities necessary to achieve these purposes. Once such a conceptual understanding is achieved, public sector auditors will then have a generic basis from which all the wide-ranging manifestations of control can be identified and evaluated. This comprehensive understanding of controls is a fundamental element of a professional auditor's body of knowledge and the basis for the auditor's credibility with auditee management.

In this part, the concept of control is explored using the systems theory introduced in the preceding part and control principles borrowed from the physical sciences and cybernetics.

Control as a Particular Type of System

In the previous part dealing with systems theory, the concept of feedback was introduced. We noted that feedback is a necessary component in any system which is designed to ensure that a certain desired state is attained or maintained. Feedback then represents the control function of such systems.

Here, we will model the feedback control function as a system represented by a number of elements and activities purposively related. As such, we are viewing feedback or control as a sub-system within the boundaries of our system developed in the previous part.

Control systems are described here in general terms without specific reference to their application in audits. The task of applying control theory to the audit context is reserved for Section Three which builds an organizational model using the systems techniques of the preceding part and control concepts provided here. The approach of moving from general concepts to specific applications is intended to ensure that a common conceptual understanding of control exists before considering how these concepts are applied to the particular requirements of the auditor.

To develop a systems model of control, we will begin with a statement regarding the purposes of control. With such a statement, we can then deduce the boundaries of the system, its elements, relationships and activities.

The Purpose of Control Systems

Various authors have suggested the following definitions relating to the purpose of control systems:

"A control system is a system whose purpose is to attain and maintain a desired state or condition." (Anthony and Dearden)¹⁰

"We are concerned with control in relation to matching performance with necessary or required conditions to obtain a purpose or objective." (Litterer)¹¹

"Control is concerned not only with the events directly related to the accomplishment of major purposes, but also maintaining the organization in a condition in which it can function adequately to achieve these major purposes." (Litterer)¹¹

"The problem of control is that of obtaining a desired result in the face of conditions that might oppose or interfere." (Rubenstein and Haberstroh)¹²

While stated somewhat differently, these samplings from management literature present a consistent picture of the purpose of control systems. Essentially, control systems are used to ensure that the purposes or objectives of the system under control are attained or maintained. Control systems are only relevant and are only applied to their parent systems, which themselves have an identifiable purpose.

Control systems help underlying systems attain or maintain their purpose by doing two things. First, control systems regulate the output of the systems being controlled by ensuring that actual results compare favourably with desired results. Second,

10 Anthony, Robert and Dearden, John, Management Control Systems, Homewood, Illinois: Richard D. Irwin, Inc. 1980, p. 3.

11 Litterer, Joseph A., The Analysis of Organizations, New York: John Wiley & Sons, Inc. 1965, p. 233.

12 Rubenstein, Albert H. and Haberstroh, Chadwick J., Some Theories of Organization, Homewood, Illinois: Richard D. Irwin, Inc. and the Dorsey Press 1966, p. 503.

control is concerned with means as well as ends. To ensure that the system under control obtains its purpose, control systems must also be involved in maintaining the internal capability of the controlled system such that it is able to continue to produce the desired outputs.

If the influences on the system being controlled, and the controlled system itself, were unchanging or changing in predictable ways, the need for controls would be minimal because there would be little risk that a process, once set in motion, would not achieve the expected results or its ultimate purpose. Environmental influences, however, rarely remain stable over time and the controlled system itself is subject to changes (e.g. wearing out). It follows that if the purposes associated with such systems are to be maintained or attained then it is necessary to impose some sort of control system so that any tendency towards instability may be detected and corrected.

- **Summary Statements: The concept of control is only relevant for purposive entities.**

Controls exist to ensure that systems attain or maintain certain desired states or conditions.

Model of a Control System: The Basic Elements¹³

Figure 4 presents a model of a control system. While this model represents a particular type of control system, it is useful for identifying the basic elements, activities and relationships associated with all control systems.

Once we have introduced these basic aspects of control systems, we will indicate how the control structure may be altered to accommodate the specific needs of the system subject to control.

13 Adapted from Schoderbek et al, op. cit., p. 308-310.

The Control Object

The control object is the variable of the system's behaviour chosen for monitoring. Changes in the status of the control object trigger the functioning of the control system. Obviously the usefulness of the control system is therefore dependent upon the proper choice of the control object.

In all control systems, some of the control objects must be chosen from the controlled system's outputs. A system seeks to attain certain results. Without some control over the variations in the state of the system's outputs there would be no information regarding whether actual performance was achieving desired ends or whether adjustment was required. Additional control objects, however, can be located over the input variables and conversion processes of the system under control. Input controls are used to either prevent faulty input from entering the system or to signal the need for adjustments in the conversion process. Conversion controls ensure that the conversion process is working as intended. Figure 4 is an example of a control system where output is the subject of control activity. Figure 5 illustrates a control system with an input as a control object.

CLOSED CONTROL SYSTEM¹³

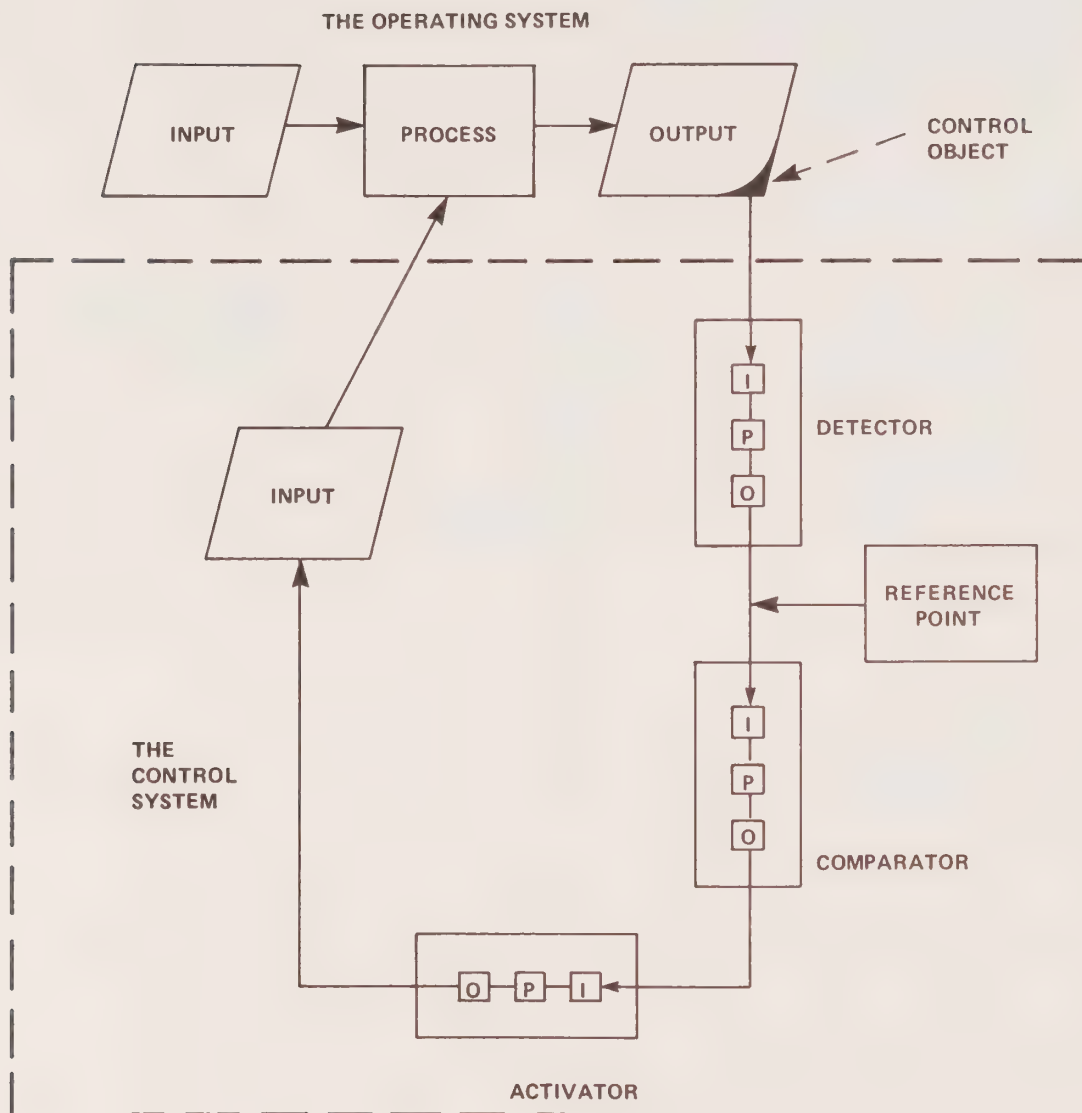
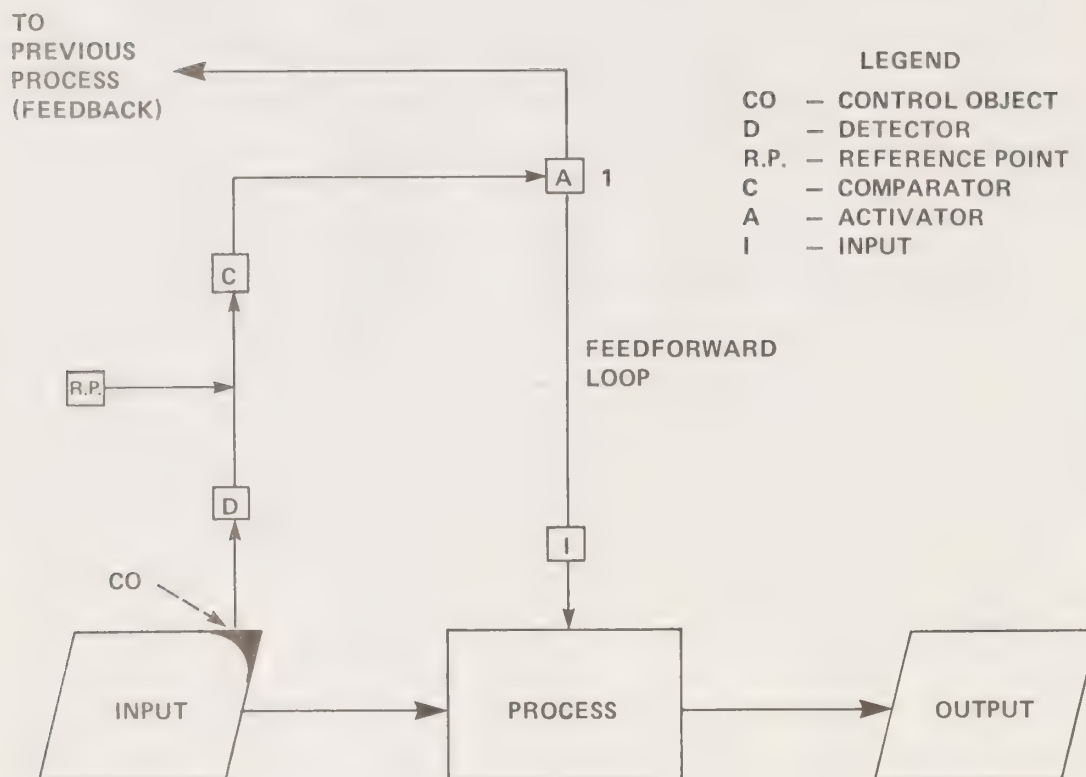


Figure 4

13 Adapted from Schoderbek et al, op. cit., p. 308-310.

INPUT CONTROL SYSTEM



1. Activator is shown to have two alternative actions; one, an adjustment to processes yet to be performed; two, an adjustment to previous processes.

Figure 5

Detector

The detector measures what is happening in the variable being controlled. It represents the control system's information supplier. As such, many of the concerns associated with information systems in general could be applied to the design and evaluation of a detector. Consideration, for example, as to frequency, capacity, efficiency, precision, cost, representativeness and adequacy of the detector as an information system should be given during design and evaluation.

Reference Point

This represents the standards against which performance may be measured or matched. Typical concerns in this area relate to the completeness and appropriateness of the standards in establishing performance criteria for the various dimensions of the systems behaviour including quality, quantity, timing and cost.

Comparator (Analyzer)

This element represents a device for assessing the significance of what is happening, usually by comparing information supplied by the detector (what is actually happening) with the established reference points (what should be happening).

This mechanism then establishes the nature of the difference between actual performance and the standard, and passes its judgment of whether the system is operating as intended on to the next element.

Activator

The activator is a decision-maker. It evaluates alternative courses of corrective action available given the nature of the deviation identified and transmitted by the comparator. The output of the activating mechanism is typically corrective action.

Corrective actions are usually directed at adjusting the operating processes of the system under control. The output of the activating system, however, can also be a corrective action aimed at altering the control sub-system itself.

In a closed system, we have already noted that there is nothing unpredictable about a system's response; it is programmed to perform according to specification. As such, in a closed system the activator would deal only with situations for which there is a decision rule for the deviation detected. We will see however in the discussion of open control systems that the "no decision rule" state can exist and is significant.

Summary

The foregoing basic elements should be found in all controls. Whenever auditors describe controls, specific recognition to each of the elements and their functions should be given to allow for proper evaluation of their adequacy. In Section Three, each of these generic control elements is redefined within an organizational context and its use by auditors specifically described.

- **Summary Statements: In all control systems some of the control objects must be chosen from the controlled system's outputs. Additional controls may be located over the input variables and conversion processes of the system under control.**

All controls contain the elements of a detector, reference points, a comparator and an activator.

Alternative Design Strategies for Control Systems

To this point, we have emphasized the purposes, elements and activities thought to be associated with the basic nature of control systems.

As we become more precise about the nature and purpose of the system to be controlled and more demanding of the type of control information that needs to be generated to achieve our control purposes, certain distinctions can be made in the detailed characteristics associated with various control systems. These differences are explored in the following. The purpose is to provide additional concepts to

auditors so that they may more accurately describe the characteristics of a particular control. Recognition of various types of controls and where they are most effective will also be useful to auditors in building their prescriptive model which forms the basis for evaluating the auditee.

- **Summary Statement: The specific design of controls should vary in accordance with the nature of the system under control.**

Strategies for Achieving Control Purposes¹⁴

At the highest level, three strategies for achieving control purposes can be identified. These strategies are:

- Yes/No controls - system activities may not proceed to the next step until a screening test has been passed; approval to continue is required; (control is preemptive).
- Steering controls - results are predicted and corrective action taken before the system's processes are completed; (control is preventative).
- Post-action controls - system activities are first completed; results are then measured and compared with a standard before control action is taken; control action is directed towards eliminating the deviation in future cycles of the process under control; (control is detective).

Each strategy represents a different viewpoint as to the type of interaction required between a system and its controlling sub-system. All strategies represent feasible ways of achieving the generic control purposes previously described.

¹⁴ Newman, William H., Summer, Charles E. and Quirby, Warran, The Process of Management - Concepts, Behaviour and Practice, Inglewood Cliff: Prentice Hall 1972, pp. 455-456.

Yes/No controls are essentially safety devices. The consequences of a faulty aspect within the system under control are considered so serious that precautions are taken to ensure that such fault does not occur. For example, the precautions taken to ensure that a parachute is not faulty may be thought of as Yes/No controls which would preempt use of the parachute if it did not meet adequate standards of quality.

Steering controls are preventative in nature and meant to provide remedial action while results are still in the process of being achieved. Results are predicted at a particular point in the system's processes and where necessary corrective action is applied to ensure that actual results come as close as possible to desired results. For example, the maintenance function may be viewed as a type of steering control. This activity seeks to direct attention towards weaknesses in the existing system so as to prevent trouble from arising. It is emphasized here that the primary aim of the activity is to direct attention rather than to evaluate.

Post-action controls are evaluative mechanisms which can adjust or provide planning data for future cycles of the process being controlled. These controls can also serve as a means of determining rewards for performance. Budgetary control and performance appraisals are types of this control strategy.

The adoption of a particular strategy for control will dictate that certain distinguishing characteristics can be associated with the various control systems. A Yes/No control is preemptive because its defining characteristic is that it may preclude further activity depending on the results of a screening test. Steering controls attempt to sustain an acceptable type of performance. These controls are forward-looking and preventative in nature, taking action to avoid the occurrence of undesirable behaviour. Post-action controls are reflective and restore performance to acceptable standards. Such controls are detective, taking action on the basis of identifying deviations that have already occurred.

Auditors must understand the purposes of the various control strategies if they are going to evaluate properly controls for effectiveness. Different operating systems require different controls and the foregoing general types provide one level of distinction.

- **Summary Statement: Controls may be preemptive, preventative, or detective.**

Environmental Considerations (Open and Closed Control Systems)

As noted earlier, a system's environment is outside of the system's direct control, but relevant portions of the environment are significant in that they include needs and constraints which influence and can be influenced by the system's behaviour.

The complexity and predictability of environmental influences upon a system should be reflected by the degree to which a control system is open or closed. Where the influences of the environment are reasonably simple to identify and have a predictable effect upon a system, or where the custodian of the operating system decides not to respond to the environment (e.g. monopoly situation), the control sub-system tends towards being closed. The system's behaviour is predetermined and uses a limited set of environmental information. The control sub-system is essentially impervious to any additional input from the environment.

Where relevant environmental factors are complex and unpredictable, a greater degree of openness should be exhibited by the control sub-system. Open systems accept additional information from the environment and therefore increase the system's ability to adjust its behaviour in a manner which satisfies environmental needs and constraints. In public organizations, most control sub-systems are open and the important consideration involves the question of degree of openness.

- **Summary Statement: Controls may be open or closed to uncontrollable (environmental) input. Where simple, predictable environmental influences exist, controls should tend towards being closed. Otherwise, controls should tend towards being open.**

Levels of Control Systems

In our general systems model, we introduced the idea of different levels of systems depending upon the observer's perspective of scale. Based on the nature of the phenomena being studied, various levels of resolution (supra-system, system,

sub-system) could be adopted. It follows that as the system, and consequently the object of control, varies in terms of scale, so also would the scale of its corresponding control sub-system.

Besides levels of scale, controls can also be classified according to levels of complexity. One way of viewing levels of control according to degree of complexity is based upon the degree of the underlying system's complexity. The more complex the system, the more complex the corresponding control sub-system must be. Complexity in this sense means a system which has many components and elaborate interrelationships. All elements of the control sub-system must have sufficient richness in complexity if it is to detect and control the variety of possible states that can be exhibited by the object of control.

Control systems can also, however, be ordered according to the complexity of the functions they perform. Consider the following hierarchy of controls based upon complexity of the functions performed:

First-order Control Systems (Corrective)

- the object of control is monitored against a predetermined goal;
- the control system is given particular commands to carry out, regardless of changes in the environment; and
- there is nothing unpredictable about the systems response, the control is programmed to perform according to specification.

Second-order Control Systems (Adaptive)

- can perform all first-order functions;
- the control can initiate alternative courses of action in response to changed external conditions;
- the control has the ability to change standards or decision rules which dictate lower-order control system behaviour; and
- in extreme cases the control system has the capability to trigger the redesign of the operating system, the control sub-system, or both.

The adaptive control system is a higher-order system in that it can perform more complex functions than the corrective system.

Figure 4 illustrates a closed, corrective control system while Figure 6 illustrates an open, adaptive control system. In Figure 6, the control system is open because it accepts additional input from the "higher authority" which is situated in the controlled system's environment. The control system is also adaptive as there is an accommodation made for supplying unprogrammed decision rules by the higher authority.

In Figure 6, we can also look at the relative complexity of the first-order control (represented by the elements up to the activator) versus the second-order control (represented by the "refer to higher authority" loop). The second-order control is more complex. First, it can handle a wider variety of states than the first-order control and supply decision rules which would otherwise not exist. Furthermore, the second-order control can handle a wider range of functions. The second-order control system can change all aspects of the lower-order system including the nature of the activator. This represents a broader and more complex range of functions than those available to the lower-order system.

We have already mentioned, in the part on general systems concepts, the importance to the auditor of identifying whether a system is open or closed, adaptive or corrective. It is through examination of the control sub-system that auditors can determine what type of system they are actually dealing with.

- **Summary Statement: Hierarchies of controls can be distinguished according to the scale of observation and according to the number and complexity of situations or functions that can be handled.**

Information Flows

Implicit in our control models depicted in Figures 4 through 6 is the transmission of information which links the various elements of the control system. Depending upon the nature and direction of the flow of control information, further distinctions can be made between types of controls.

OPEN, ADAPTIVE CONTROL SYSTEM

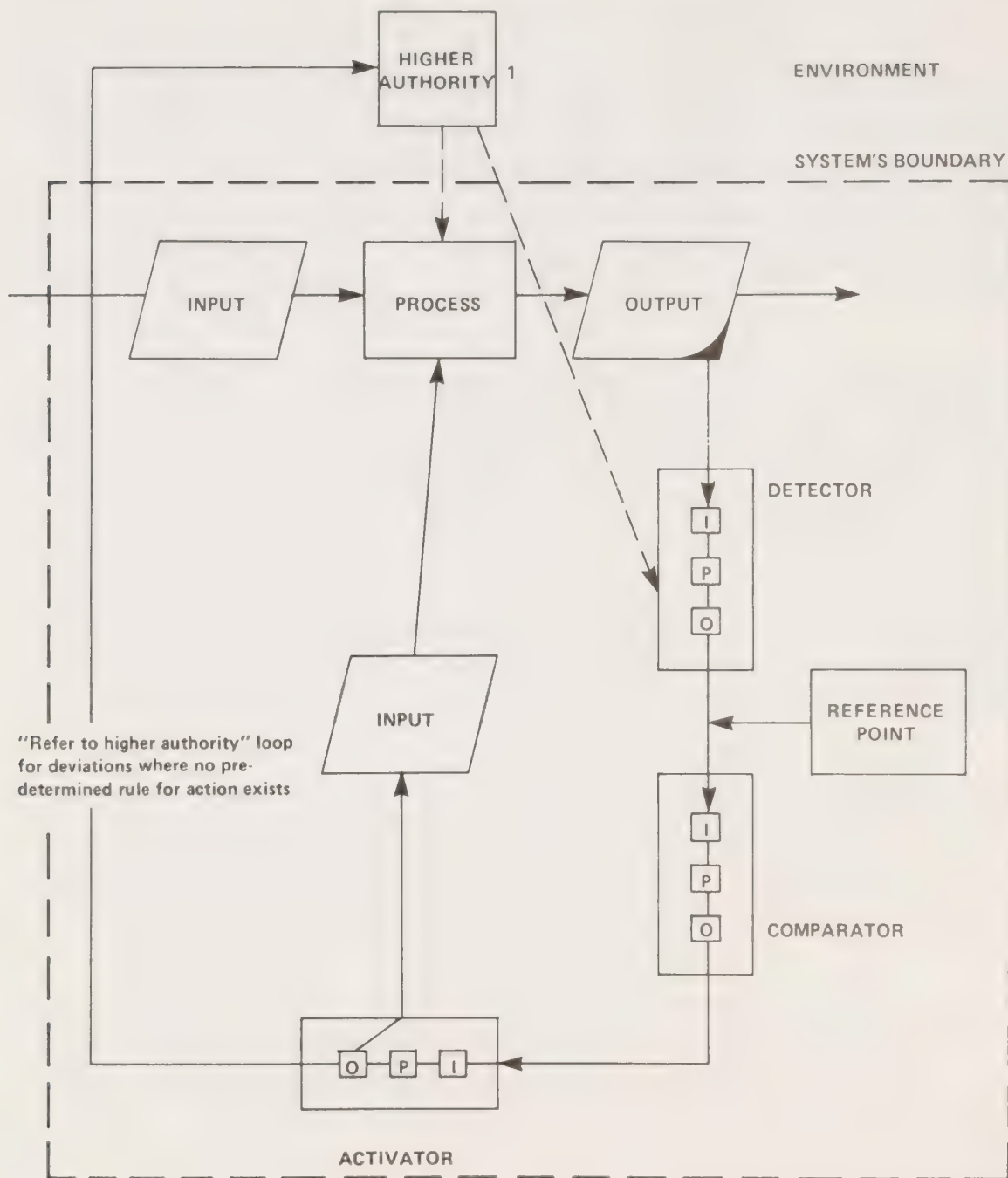


Figure 6

In a feedback situation, control information arises from judgments concerning the performance of conversion activities which have already occurred. This information is transmitted to the activator which governs the behaviour of the conversion processes under review (see Figures 4 and 6 for examples of feedback information flows).

In a feedforward situation, control information is derived before the implementation of conversion activities to which it relates. This information is transmitted to an activator which adjusts conversion activities that are still to be performed (see Figure 5 for an example of a feedforward information flow).

- **Summary Statement: The transmission of control information may be characterized as either being feedback or feedforward.**

Summary

In this part, we have described a model of control using system theory fundamentals. We began by describing the purposes, elements and activities thought to be present in all effective control systems. We then introduced characteristics that could vary between control systems depending upon the strategies adopted to achieve control, the complexity of the underlying systemic processes and the nature of the system's environment. Figure 7 summarizes in decision-table format a decomposition of a control system according to the different variables that have been discussed up to this point. This decomposition is meant to classify, according to type, any particular manifestation of control.

The systems techniques, the control model and the decision-table decomposition represent tools that internal auditors can use in both describing and evaluating an organization's control framework. In Section Three, we will explore how the auditor can model organizational activities using the systems and control concepts provided.

CONTROL SYSTEM VARIABLES

| | |
|--|--|
| <p>CONTROL OBJECT, DETECTOR, REFERENCE POINT, COMPARATOR AND ACTIVATOR</p> | <p>1. Basic elements</p> |
| <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>YES/NO PREEMPTIVE</p> <p>↓</p> <p>①</p> </div> <div style="text-align: center;"> <p>STEERING PREVENTATIVE</p> <p>↓</p> <p>①</p> </div> <div style="text-align: center;"> <p>POST-ACTION DETECTIVE</p> <p>↓</p> <p>①</p> </div> </div> | <p>2. Alternative design strategies re: relationship of control subsystem to operating system</p> |
| <div style="text-align: center;"> <p>①</p> <p>↓</p> <div style="display: flex; justify-content: space-around;"> <p>OPEN</p> <p>CLOSED</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>ADAPTIVE</p> <p>↓</p> <div style="display: flex; justify-content: space-around;"> <p>I</p><p>P</p><p>O</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>②</p><p>②</p><p>②</p> </div> </div> <div style="text-align: center;"> <p>CORRECTIVE</p> <p>↓</p> <div style="display: flex; justify-content: space-around;"> <p>I</p><p>P</p><p>O</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>②</p><p>②</p><p>②</p> </div> </div> <div style="text-align: center;"> <p>CORRECTIVE</p> <p>↓</p> <div style="display: flex; justify-content: space-around;"> <p>I</p><p>P</p><p>O</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>②</p><p>②</p><p>②</p> </div> </div> </div> </div> | <p>3. Other design considerations</p> <p>A) Acceptance of uncontrollable input</p> <p>B) Learning capacity</p> <p>C) Location of control object (I – Input, P – Process, O – Output)</p> |
| <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>FOR YES/NO CONTROLS</p> <p>②</p> <p>↓</p> <p>FEEDBACK</p> </div> <div style="text-align: center;"> <p>FOR STEERING CONTROLS</p> <p>②</p> <p>↓</p> <p>FEEDFORWARD</p> </div> <div style="text-align: center;"> <p>FOR POST- ACTION CONTROLS</p> <p>②</p> <p>↓</p> <div style="display: flex; justify-content: space-around; width: 100px;"> <p>FEEDBACK</p><p>FEEDFORWARD</p> </div> </div> </div> | <p>D) Direction of flow of control information</p> |

Figure 7

SECTION THREE: CONTROL MODELS FOR AUDITS

In this section, two organizational control models are presented for use by auditors in their examinations. The first part of Section Three relates to the development of a descriptive organizational model. Auditors would prepare such a model when documenting their understanding of the actual processes subject to audit. The discussion begins with organizational modelling and finishes with the presentation of how the auditor can build a descriptive model of the processes subject to audit incorporating the concepts and techniques provided in Section Two.

The second part of Section Three provides information relating to the development of a prescriptive model. This model contains the standards or criteria through which the actual auditee operations will be evaluated. The model is developed independently of the descriptive model so that the evaluative criteria are not biased by a knowledge of the actual controls. Discussion focuses on the issues related to the development and use of the predetermined control model and again employs the concepts and techniques provided in Section Two.

Descriptive Organizational Models

In Section Two, it was noted that controls are applied only to purposive entities. An organization exhibits purpose through its goal-seeking behaviour, and as such, needs controls to ensure that the desired state or conditions specified in its goals are attained or maintained. Here, the generic control system of Section Two will be restated as an organizational model.

This section begins with a review of the purposes of organizational models from the auditor's perspective. It then considers various traditional approaches that have been typically used in generating such models and the limitations associated with their usage. Finally, the organizational control system model is introduced including a discussion of the techniques by which the model can be elaborated. The organizational control model uses the same concepts as those used in the generic model of Section Two and the paper links the two models on an element-by-element basis.

Purposes of Organizational Models¹⁵

Models are of particular importance to analysts of all types of organizations. Faced with a confusing array of facts, analysts use models to bring order to their comprehension of organizational structure and behaviour.

Specifically, a descriptive organizational model of the audited entity assists auditors in the following ways:

- communicating within a multi-disciplined group of auditors and between the auditors and the auditees (the model provides a common basis for understanding the organization);
- focusing on the organizational elements to be audited (scope of the audit);
- determining and displaying the key operations of the organization under audit (raison d'être of the organization);
- determining and displaying the management complement and the instruments through which it works (mandate, etc.);
- focusing on organizational dynamics and cause/effect relationships; and
- understanding the interaction between the organization and its environment.

In summary, the organizational model serves as a vital tool in the structuring and communication of an auditor's approach to an examination.

¹⁵ Audit Services Bureau, Introduction to Operational Audit, Supply and Services Canada, 1978, p. 30.

Conventional Approaches to Organizational Modelling

The organizational model illustrated here uses systems and control concepts. To appreciate the value in using a control system approach to modelling organizations, this part explores traditional approaches and their limitations.

At the most fundamental level, organizational activity can be represented by numbers, words or pictures. Once the symbol has been chosen, it is then structured in accordance with some underlying model. The most traditional one is the financial accounting model, based on the premise that each activity in the organization has its monetary equivalent. The monetary unit is used to represent an entity's resources and activities. The model is flexible enough to provide both a static and dynamic portrayal of an entity's activities through the use of representations such as the balance sheet and income statement. Other ways have been used including many types of structural representations. The organization chart approach is a typical example of a structural model of an organization where different sectors are represented according to formal relationships, delegated authorities, responsibilities and activities.

The systems approach represents organizational activities according to the input-process-output-feedback-environment concepts discussed in Section Two. A significant advantage in the use of this approach over traditional models is that the analyst must make explicit the assumptions used in developing the model of the system under review. Traditional models generally contain fixed assumptions concerning the purpose, elements, relationships and boundaries of the entity under review. The appropriateness of these fixed assumptions is generally not scrutinized and they have improperly become almost the equivalent of universal truths. This lack of explicit examination creates the possibility that changing conditions may render the assumptions invalid and the model obsolete. In the systems approach, there are no fixed assumptions. The analyst is forced to define these aspects. As such, the assumptions of the model must be explicitly stated and be readily available for review for appropriateness. The need for redefinition of assumptions because of changed conditions affecting the entity under review will be more evident using a systems approach.

Other important advantages can be associated with the use of the systems approach over traditional models. First, a systems approach allows specific recognition of the organization's environment as an important variable of the model. Second, the systems model provides a wider range of options for sub-dividing an entity into smaller units for analysis. These advantages are clarified below.

The financial and organizational structure models tend to be relatively closed to considerations about the organization's environment. Generally, in the use of these models, the characteristics which define an organization are its internal aspects, while external environmental interaction is for the most part considered inconsequential to the definition of the term organization. A systems model typically focuses on the organization-environment interface because it is usually assumed that the organization is an open system which cannot be defined exclusively by its internal characteristics. Specific consideration of the organization's interface with its environment is becoming increasingly important given the growing complexity and dynamic character of these relationships.¹⁶

Conventional models tend to be structured on the basis of a limited number of criteria. For example, organization chart models are based on a sub-division of formal authorities, relationships and responsibilities. A systems model is based on common purpose and includes all parts and all interactions involved to bring this purpose about. This wide representation of types of relationships in the model provides a greater richness in the number of sub-systems that can be defined for more in-depth analysis. When studying aspects of an organization, the breadth of the systems approach is clearly advantageous. For example, conventional models which sub-divide the organization according to its structure cannot easily deal with subjects, such as information flows, that cross formal organizational divisions. The study of information flows or other matters that cross the basis for sub-dividing the whole is performed awkwardly and often in a piecemeal, specialized manner. A systems approach, being more flexible in the alternative ways in which sub-systems are defined, can readily structure an information flow sub-system for detailed analysis.

16 Schoderbek, Peter P., Kefalas, Asterios G. and Schoderbek, Charles G., Management Systems Conceptual Considerations, Dallas: Business Publications, Inc. 1975, pp. 125-126.

With these advantages in mind, the next part identifies a major concern relating to the use of a systems approach in modelling organizations and some of the techniques that can be employed to help ensure that a credible model is developed.

Dealing with Systems Modelling Concerns

In general, the analyst should recognize that one problem with the use of any model is the difficulty of representing in simpler form the enormously complex data relating to an organization. A systems model is not unique in this respect and some difficulty will likely be experienced in fitting information concerning the organization into the input-process-output-feedback-environment scheme. Three activities may help the analyst achieve a credible systems model.

First, the analyst must clearly define in an organizational context precisely what data are to be accumulated under each system element. In the next part, the auditor is given some help in this regard. The control concepts discussed in Section Two are redefined to reflect their nature in an organizational setting. These definitions will provide one example of the way in which auditors can initially identify a framework for the accumulation and classification of organizational information.

A second activity in developing a credible systems model is to develop an understanding by using a series of models which start at a high level of abstraction and move progressively to greater and greater levels of detail for particular aspects of the more broadly conceived system. The use of this technique is illustrated in Figure 8.

This example considers the case of an auditor wishing to do an audit of a division of a department. As a start to developing an understanding of the division, the auditor may construct a simple overview model of the entire department. The elements at this level are broadly defined and give a picture of overall departmental mission, objectives, strategies and major programs. At the next level of resolution, the auditor may model the one branch that contains the division being audited. Greater detail is brought to the original descriptions concerning mission, objectives, strategies, etc. A third model, that of the division itself, would provide even

MODELLING USING TECHNIQUE OF PROGRESSIVE ELABORATION

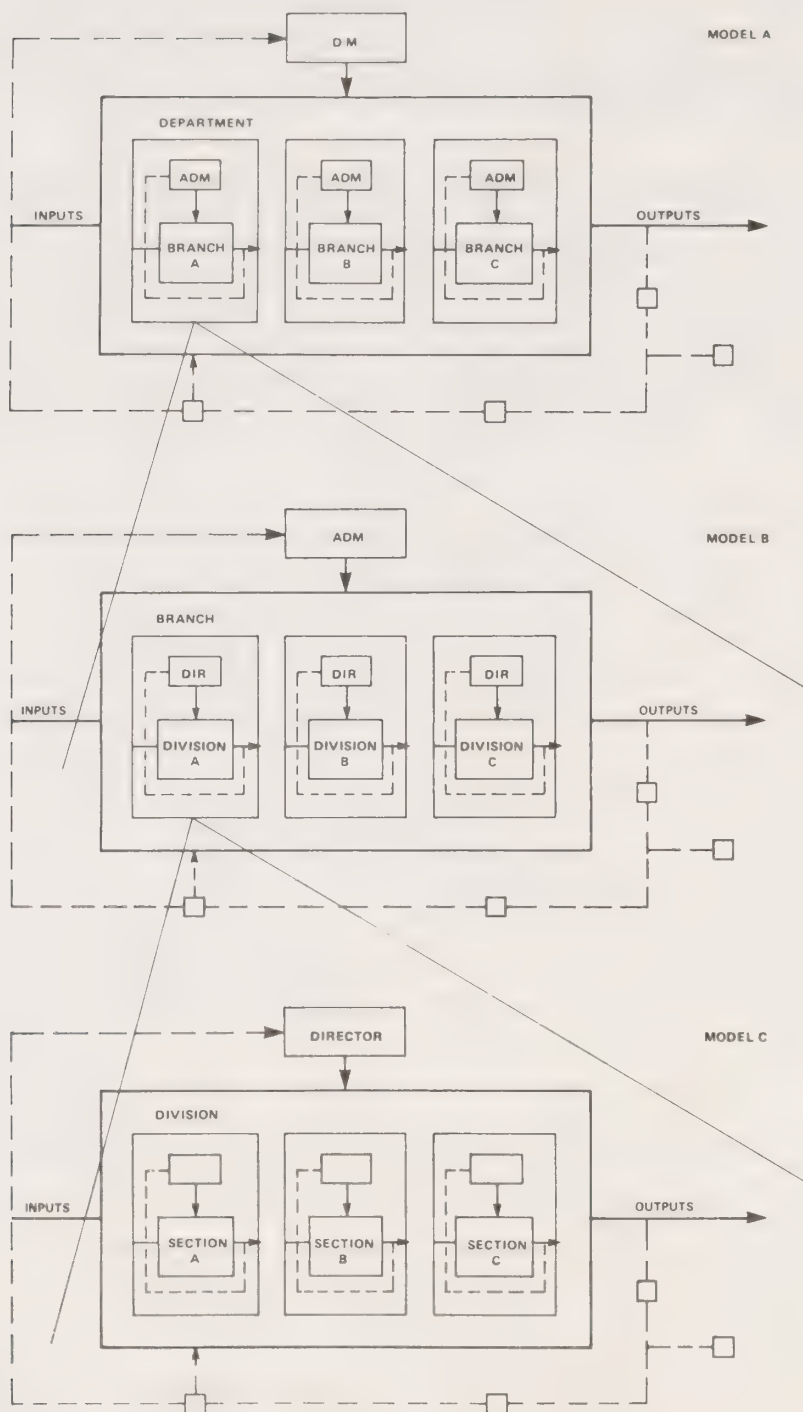


Figure 8

greater levels of detail. This technique of progressive elaboration helps cope with the vast amount of information that must be dealt with during an audit. The auditor retains an appreciation of the interrelationship of the entity under review with other organizational elements, but avoids overemphasis of modelling aspects of the system that are relevant only to a limited degree.

Modelling through progressive elaboration is used to illustrate how each of the generic control elements of the organization model can be brought into focus. Subsequent to the definition of the elements of the organization control model in the next part, an elaboration is provided as to how each element of the most abstract model can be defined in a more detailed way.

A third activity which helps ensure that the auditor's representation of an organization is appropriate involves confirming the accuracy of the model with the auditee. This technique should be familiar to all auditors and will not be given further elaboration.

An Organizational Control System Model

As noted, the development of an organizational control model first depends on proper definition of the elements of the system involved. The control concepts discussed in Section Two are redefined here to reflect their nature in an organizational setting. The definitions used for each of the control elements have been adapted from the Audit Services Bureau's organizational model. It is stressed that, though its definitions have survived the test of time, they represent only one example of the many ways in which a generic control model can be expressed in organizational terms.

The definition of organizational control terms are reflected in Table 1. An initial layout of the control system is also shown in Figure 9. Once this structure is presented, subsequent parts go on to elaborate upon these initial terms.

Table 1

General versus Organizational Control System Elements

| General Control System Element (from Section One) | Organizational Control System Element ¹⁷ (adapted from Audit Services Bureau model) |
|---|---|
| <u>Environment</u> | <u>Environment</u> |
| - is external to the boundaries of the system structure; | - all conditions, circumstances, etc., surrounding and affecting the development of an organization; |
| - relevant in that it influences and can be influenced by the system's behaviour; | - the essential conditions may be categorized along the following divisions: <ul style="list-style-type: none"> i) environmental needs ii) environmental resources iii) environmental constraints iv) environmental influences; |
| - not controllable by the system. | - <u>environmental needs</u> may be a product or service that is useful to society but is currently unavailable; |
| | - <u>environmental resources</u> include money, materials, machines, people and ideas; |
| | - <u>environmental constraints</u> include laws and regulations; and |
| | - <u>environmental influences</u> include political, social, economic, technological, moral and ethical influences. |

17 Audit Services Bureau, op. cit., pp. 17-27.

Table 1 (cont'd)

General versus Organizational Control System Elements

| General Control System Element | Organizational Control System Element ¹⁷ |
|---|--|
| <u>Higher Authority</u> | <u>Management</u> |
| <ul style="list-style-type: none"> - responsible for the design, implementation and control of the processes of the underlying system; - in an open system, information from the environment is accepted for consideration by the higher authority. | <ul style="list-style-type: none"> - this model assumes that regardless of the actual number of managerial levels in an organization, they can be fit into two general categories: <ul style="list-style-type: none"> i) general management ii) operational management; - <u>general management</u> is concerned with the perception of the environment and the definition of the appropriate mission, objectives and strategic plans of the organization; - this level issues policies, directives and guidelines to operational management to provide a framework for action; - essentially it represents a second-order higher authority over the actual organizational operations; - <u>operational management</u> translates the policies, directives and guidelines into operational plans, procedures, techniques and performance standards which govern the deployment of resources, the method of operations and their control; - essentially this level operates as a first-order higher authority over the actual organizational operations. |

Table 1 (cont'd)

General versus Organizational Control System Elements

| General Control System Element | Organizational Control System Element ¹⁷ |
|--|---|
| <p><u>Inputs</u></p> <ul style="list-style-type: none"> - they are the start-up force that provides the system with its operating necessities be they material, energy, demands for products and services, humans, or simply information; - can be outputs of other systems or a reintroduction of a portion of the output of the same system. | <p><u>Inputs</u></p> <ul style="list-style-type: none"> - goods, data or resources which come from outside the boundaries of the organization; - they initiate or are used in a work process; - resources may include finances (cash, credit), equipment (production, office), materials (raw materials, parts, components), staff, technology (patents, copyrights, methodology, processes, techniques, ideas), intangibles (goodwill, location) and physical facilities (land, buildings). |
| <p><u>Process</u></p> <ul style="list-style-type: none"> - that which transforms input to output. | <p><u>Transformation Processes</u></p> <ul style="list-style-type: none"> - all activities necessary to convert resources (input) to finished marketable products or services (output); - two systems: production and support; - <u>production system</u>: involved directly in the preparation of the organization's products or services; - <u>support system</u>: involved in acquisition, maintenance, and disposal of the organization's internal resources. |

Table 1 (cont'd)

General versus Organizational Control System Elements

| General Control System Elements | Organizational Control System Elements ¹⁷ |
|--|---|
| <u>Outputs</u> <ul style="list-style-type: none"> - products, services, information or energy resultant from systemic processes. | <u>Outputs</u> <ul style="list-style-type: none"> - products of operations. |
| <u>Information (including Feedback)</u> <ul style="list-style-type: none"> - information is the force which links each element of the system together; - feedback is found in all purposive systems and is used to ensure that the desired state of the system is maintained or attained; - feedback represents the control function of a system; - as a sub-system, the control function includes the following elements: control object, detector, reference point, comparator, activator and higher authority (previously mentioned). | <u>Information (including Control Data)</u> <ul style="list-style-type: none"> - means of linking various elements of the organizational model together; - organizational information is captured within two classes of systems: operations information and management information; - <u>operations information systems:</u> communicates operations data to operating personnel to identify what is happening at operations levels; - also communicates control data which represents to operating personnel and management the degree to which operations conform to expectations; - <u>management information systems:</u> supplies information to the decision-making processes which are involved in the interaction between the organization's operations and management and between the organization and its environment. |

ORGANIZATION CONTROL MODEL¹⁸

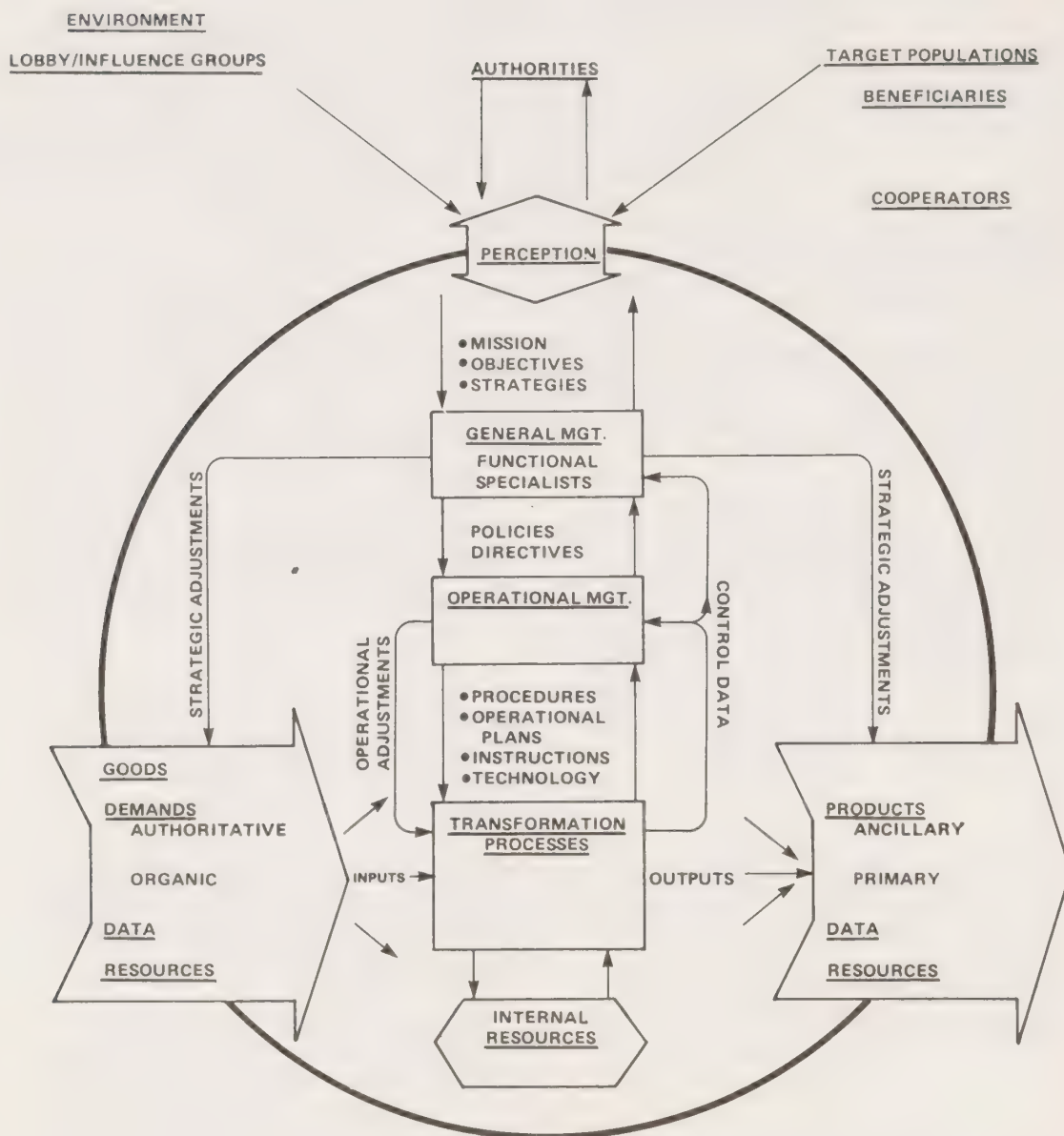


Figure 9

18 Adapted from Audit Services Bureau, A Structured Methodology for the Conduct of Comprehensive Auditing, Supply and Services Canada, 1982, Annex A Diagram 8.

Initial Adjustments to the Organizational Model

The organizational model shown in Figure 9 represents a useful variant of a systems model and it is presently used by a number of federal government internal audit groups. Being a type of systems model, it allows the integration of the system and control concepts raised in Section Two. Figure 10 represents a modification of Figure 9 which visibly incorporates the system and control concepts of Section Two into the overall framework provided by Figure 9. While some of the detail of Figure 9 has been omitted from the revised model to highlight the modifications made, it is assumed that the excluded details will be incorporated into the actual model developed by the auditor.

The following modifications have been made in Figure 10:

- The general management and operational management elements are clearly distinguished as controllable processes with identifiable inputs, outputs and feedback loops. As such, the management processes are identified as special transformation processes from which management outputs are derived. Because of the importance of management outputs to the design, operation and control of the organizational processes, specific identification of the processes which generate these outputs is important. An adequate representation of management processes provides the auditor with a basis for evaluating whether desirable management outputs can be produced. The management processes are sub-systems of the larger organizational system and their output generally becomes input for the next internal sub-system.
- There is specific recognition of a higher authority in the environment of the entity under review. Essentially, this elaboration differentiates between general environmental influences and influences from a higher authority. In most situations, persons performing strategic general management functions for the entity under review take instruction from, and are accountable to, a higher authority. This relationship is considered sufficiently significant to warrant separate recognition. The higher authority properly belongs in the environment of the entity under review, in that it is not subject to control by that entity.

AN ORGANIZATIONAL CONTROL MODEL - MODIFIED VERSION

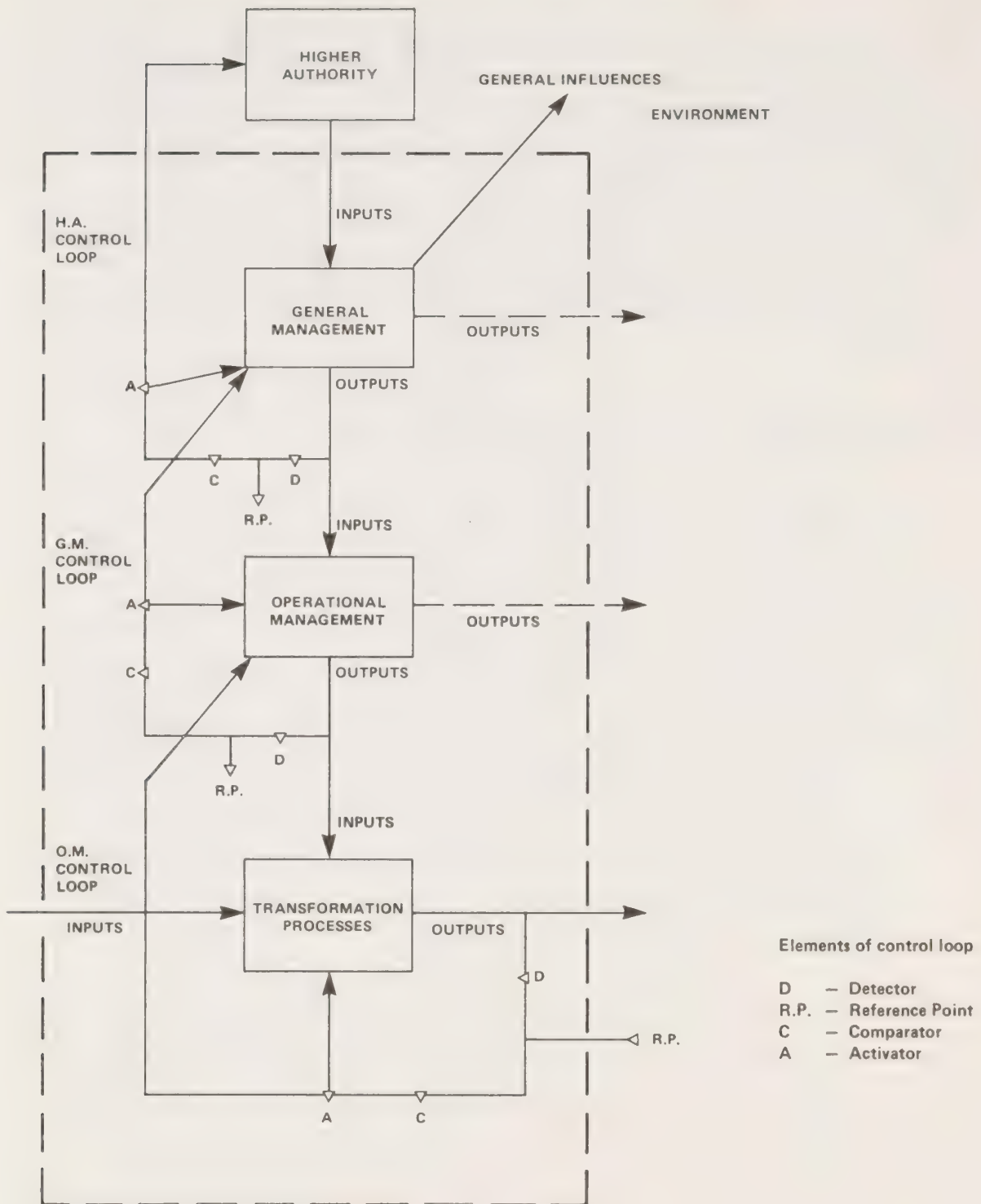


Figure 10

Depending upon the observer's point of view, the general and operational management elements can also be viewed as higher authorities. When the operational management element is viewed as the operating system (e.g. is the focus of the audit), the general management element becomes a higher authority situated in the environment of the operating system under review. Likewise the operational management element can be viewed as a higher authority over the transformation processes.

- The control data loop from Figure 9 has been given greater detail, in accordance with the control system model in Section Two. The auditor's primary perspective for evaluation is through the control framework. Consequently, elaborations of the elements and functions of the control sub-systems provide auditors with a more concrete basis for their review. For convenience in presentation, all of the control loops shown in Figure 10 are represented as the same type of sub-system. They are located at the output position of the process they are controlling. The controls are all open in that they can accept uncontrollable input from a higher authority. Recalling from Section One the various characterizations that controls can exhibit, it will be recognized that Figure 10 could be adjusted to include varying types of control sub-systems (e.g. closed with feedforward loops, located over input or conversion processes).

Secondary Elaborations on the Organizational Model

According to the discussion provided earlier, the initial definition of organizational terms requires elaboration if a clear understanding of the processes under review is to be achieved. Each of the primary elements of the model shown in Figure 10 can be looked at individually so as to expand the analyst's awareness of the processes at work. Figure 11 represents an expanded view of the general management element included in the original model.

In Figure 11, the general management element of the overall model is shown to include the processes of planning, implementing and controlling. A new model, in effect, has been created to describe one element of the organization model. Such elaborations should be performed for all other elements of Figure 10. To illustrate

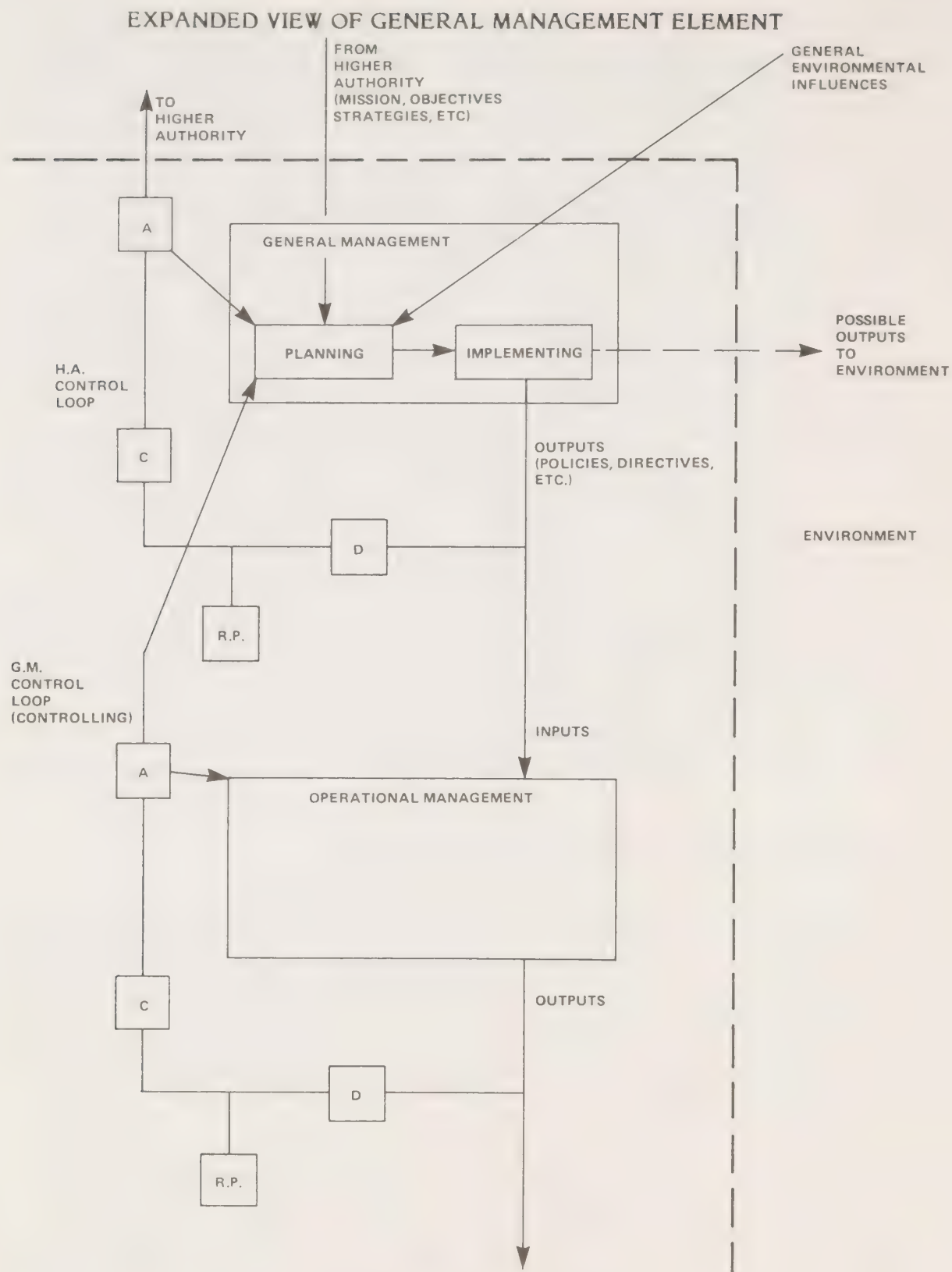


Figure 11

this point, an expanded view of modelling the management elements and control loops of the organization model follows. Reference will also be made to other possible elaborations.

i) Detailed Models of the Managerial Elements

Both the general management and the operational management elements of the organizational model represent processes which produce their outputs on the basis of managerial action. These elements act as an important link between the organizational model and the extensive literature available on the modelling of managerial activities. Essentially, the organizational model establishes the context surrounding managerial activities. The managerial model increases the detail of information gathered and classified for one element of the model.

Even the most preliminary survey of management literature will reveal the many alternative methods available for modelling management activities. Table 2 summarizes some of the various proposals made. While no real consensus exists, four functions (planning, organizing, directing and controlling) have gained widespread recognition. Our conclusion is that the use of these categories of managerial activities will be beneficial to the auditor when observing and categorizing information relating to the nature of managerial work. This conclusion is reflected in the detailed model of the general management element in Figure 11. The activities of the manager are described by the three functions planning, implementing and controlling where the term implementing represents the classification of the tasks of organizing and directing under a single heading.

In addition to identifying broad categories for classifying management activities, the auditor must also determine an adequate description of activities included within each managerial category. Management writers have not agreed upon a definition for any of the managerial processes with any great degree of precision and again the auditor is left with a decision of choosing among available alternatives.

For a more detailed discussion of the relationship of management and control refer to Chapter 3 of this Volume, entitled "Management Control: Concepts and Practices".

Table 2

Lists of Management Functions¹⁹

| Dale | Koontz and O'Donnell |
|-------------------------------|----------------------------|
| Planning | Planning |
| Organizing | Organizing |
| Staffing | Staffing |
| Directing | Directing |
| Controlling | Controlling |
| Innovating | |
| Representing | Longenecker |
| Greenwood | Planning |
| Planning | Organizing |
| Decision-making | Directing and Motivating |
| Organizing | Controlling |
| Staffing | |
| Directing and Leading | Massie |
| Controlling | Decision-making |
| | Organizing |
| | Staffing |
| Gross | Planning |
| Decision-making | Controlling |
| Communicating | Communicating |
| Planning | Directing |
| Activating | |
| Evaluating | Mintzberg |
| | Interpersonal Role |
| Johnson, Kast, and Rosenzweig | Informational Role |
| Planning | Decisional Role |
| Organizing | |
| Controlling | Newman, Summer, and Warren |
| Communication | Organizing |
| | Planning |
| | Leading |
| | Controlling |
| | Voich and Wren |
| | Planning |
| | Organizing |
| | Controlling |
| | Administering |

19 Miner, John B., The Management Process - Theory, Research, and Practice, New York: The MacMillan Company 1973, p. 48.

ii) Elaborations of Control Loops

The control loops attached to each process in Figure 10 represent the other important sub-systems within the overall organizational control system model. As will be shown subsequently, it is through the evaluation of these control sub-systems that the auditor determines the adequacy of the organizational processes and managerial concern for results. As such, it is evident that the auditor must obtain an adequate description of the control sub-system to provide a basis for evaluation.

The elements of the organizational control sub-system are consistent with those of the generic control system depicted in Figure 4. The following points represent a guide to modelling each of these control elements in an organizational context. These points are meant to be illustrative and do not represent a complete discussion of modelling control sub-systems.²⁰

Object of Control: As noted in Section Two, the control object is the aspect of the system's behaviour chosen for monitoring and control. The choice of the control object is a key concern of the manager as it determines the behaviour of the whole control sub-system. The control object can be found at the input, process or output locations of the entity under control.

The auditor's primary interest in gathering information on the control object is to answer the following questions:

- which aspects of the system's behaviour are monitored and controlled? which aspects are not? (consider the dimensions of quantity, quality, timing and cost).
- which control objective is meant to be served through the observation and control of the identified control objects?

20 Edds, John A., Management Auditing Concepts and Practice, Dubuque, Iowa and Toronto, Ontario: Kendall/Hunt Publishing Company 1980, pp. 172-173.

Detector: The detector sub-system scans the control object and feeds this information to the other elements of the control sub-system.

The auditor would gather the following information on the detector:

- attribute being measured;
- frequency with which information is gathered;
- capacity of the detector to absorb information;
- efficiency of the detection processes;
- precision and accuracy of information detected; and
- cost of detection.

Literature relating to management information systems provides an additional basis for gathering more specialized information relating to the detection function.

Reference Points: In an organization, these represent the benchmarks established for acceptable system outputs and behaviour. The auditor would look for and describe standards relating to the aspects of the system's outputs and behaviour being monitored (e.g. quantity, quality, timeliness, cost).

Comparator: The function of the comparator is to compare actual performance against an identified standard.

The auditor would be interested in:

- the frequency of comparisons of actual against desired; and
- the sensitivity of the comparator - the auditor would note how much the control object is allowed to vary before a signal is generated identifying a deviation in the system's behaviour.

Activator: The activator is a decision-making mechanism (or decision-maker if a person) which acts in accordance with predetermined rules to correct deviant system behaviour. When no decision rule exists, the activator refers the deviation to a higher authority.

The auditor would gather information on:

- the nature and frequency of deviations requiring response and how they are handled;
- the effects of the activator's response;
- the nature and frequency of deviations referred to a higher authority and the effects of such referrals; and
- the nature of the activator's decision-making processes where some discretion is allowed.

Varying Design Considerations: In Section Two, we noted that certain distinctions can be made in describing the detailed characteristics associated with various controls. Auditors, by including a description of whether controls are preemptive, preventative, or detective, open or closed, adaptive or corrective, feedforward or feedback, will establish a better basis for their subsequent evaluation of the adequacy of the controls. Auditors should also include in their models an indication of whether the nature of the operating system and its environment are consistent with the type of control system in place (Section Two provided some guidance in this regard).

iii) **Elaborating Other Elements of the Organization Model**

Just as the management elements and control loops were subject to elaboration, so also can all other elements of the overall organization model be further described in detail. While it is beyond the scope of this paper to suggest detailed models for each of the other major elements, a few comments can be made.

With respect to the organization-environment interface, the auditor is most interested in identifying key environmental influences and the nature of the scanning system employed by the organization to maintain and regulate information concerning the environment.

Information flows between the elements of the organization model would also be of concern to the auditor. The information flows can be modelled as unique sub-systems containing inputs, processes, outputs and control loops.

Finally, the transformation processes can be described in detail by the auditor. The auditor attempts to depict operational processes to the extent that they are predictable or prescribed and can be related to outputs at least in a general manner. This depiction is normally accomplished through the use of narrative description, flowcharting techniques or decision tables.

Summary

In this first part of Section Three, attention has been centred on developing an organizational model which can be used by the auditor when developing an understanding of the entity under review. To this point, the auditor has been involved in describing the entity without concern for judging the adequacy of the processes reviewed.

In the development of descriptive models, it has been suggested that the auditor clearly define the elements under review, use a series of progressively more elaborate models and verify the accuracy of completed models with the auditee. Because the auditor, in preparing a descriptive model, is concerned with "what is going on" in the entity under review and not "what should be going on", there is general encouragement to draw freely from management literature as an aid to sorting out complex data.

The balance of Section Three is devoted to the development of a prescriptive or normative model which provides the auditor with the basis for determining the adequacy of the auditee's control framework. The normative model contains standards of expected performance which, when applied against the auditor's descriptive model, provide an initial basis for concluding on the adequacy of the auditee's operations. In the audit environment, this model is normally referred to as the predetermined control model.

Prescriptive Organizational Models

Prescriptive models contain the value system or standards that an auditor uses to evaluate the adequacy of the entity under review. The development of the prescriptive model represents a critical component of the audit assignment process since the ultimate quality of the audit report and its usefulness to management will depend on the soundness and relevance of the standards or criteria the model employs. One type of prescriptive model used by auditors is called a predetermined control model.

Predetermined Control Model - Outline of its Contents

As envisaged in this chapter, the predetermined control model should identify those controls considered essential to the operations of the audited entity. For each control within the model, there should be:

- an explicit statement of the objective served by the control;
- standards relating to what constitutes proper control design;
- indicators which will help establish whether the control is operating effectively (i.e. criteria for judging adequacy of performance).

With this information, the auditor has a satisfactory basis for evaluating the operations of the auditee. Comparison of actual processes and controls of the auditee operations with the standards established within the predetermined control framework should allow the auditor to conclude whether all essential controls exist, are properly designed and operating effectively.

Responsibility for Preparing the Predetermined Control Model

Criteria used to judge the adequacy of controls have not been codified in the form of generally accepted principles for many areas subject to audit by internal auditors. To a large extent, the criteria embedded in the predetermined control model must be first chosen on a judgmental basis by the internal auditor.

While auditor judgment is necessary in the determination of criteria, internal auditors should not unilaterally establish the criteria to be used on any given assignment. Instead, auditors should seek input from the intended recipients of the audit report and from auditees before determining the criteria to be used. In addition to this input, auditors should also attempt to ensure that all criteria used are supported through reference to an authoritative source (e.g. legislation, central agency and departmental policies, applicable generally accepted practices, etc.) where appropriate and feasible.

Obtaining input from the intended recipient of the audit report is particularly useful in ensuring that the final audit product is relevant to the persons served by the audit process. In the federal government, the internal auditor performs audits primarily for a deputy minister or a department's senior officials. Secondary users of internal audit reports would include departmental managers subordinate to those noted above and external audit or central agency review groups who may rely on the work performed by the internal auditor. Input from these users can help the auditor in decisions relating to what areas should be emphasized in the auditor's examination and what criteria may apply for evaluating performance.

Obtaining input from auditees is also of use in the establishment of audit criteria because of their intimate understanding of the operations subject to review. Because of the vested interest of the auditee in the outcome of the auditor's assessment, they are more useful when employed as a challenge process to the soundness of the criteria developed by the auditor than as an original source of information.

Guidelines for Developing the Predetermined Control Model

Two specific problems are involved in the development of a predetermined control model:

- How does an auditor determine whether all essential controls have been included in the model?
- What types of criteria can be used for assessing the adequacy of control design and effectiveness?

This part will explore possible ways the auditor may attempt to find answers to these questions.

i) Identifying Essential Controls

One of the most difficult tasks facing the auditor is determination of what controls should be subject to evaluation. Because of the complexity of the operations the auditor is often facing, the task should be approached as systematically as possible.

In reviewing any organizational activity, the auditor can initially view it as a system which is attempting to achieve certain results through a given process. The auditor is interested in assessing the adequacy of the controls designed to ensure that intended results are achieved and any process procedures required to produce these results are being properly performed. At a coarse level of resolution, then, auditors are concerned with the adequacy of controls over results and controls over process.

The auditor can further refine this initial decomposition of the auditee's operations. Using the systems concepts noted in this chapter, processes can be looked at as containing inputs, conversion activities and outputs. In the federal government, statements about results can typically be reconciled to the three dimensions of economy, efficiency and effectiveness. These further divisions of the auditee's operations help auditors focus in on the types of controls that relate to more specific aspects of the system under review.

For each sub-division of the auditee's processes and results noted above, the auditor should determine what specific objectives management of that operation is trying to achieve. Given an understanding of these objectives, the auditor should then assess what could go wrong in the pursuit of these management objectives. In other words, where are controls needed?

Table 3 identifies in broad terms typical control objectives that one could likely derive from using the general questioning process noted above. The intention of this illustration is to provide a general classification scheme for various control

objectives and where they are most likely to apply in the system under review. Auditing texts often enumerate more specific control objectives which one should be able to integrate within this general scheme.

- Identifying Auditee Processes

Implicit in the above discussion is the assumption that the auditor is reviewing a system which contains only one process. Earlier in this chapter, the development of a descriptive model of the auditee involved three processes: a general management process, an operational management process and the operational process itself. It is contended here that these three processes will typically be found in most entities subject to audit. Consequently, the predetermined control model should typically be multi-dimensional, identifying control objectives for each of the several processes normally contained within a single audit entity.

It should also be recognized that predetermined control models are developed not only to audit existing systems and processes but can be used as a template for pre-implementation audits of systems under development.

- Materiality and Evaluation of Controls

The procedures to this point will provide the auditor with a method for identifying the range of control objectives that can be subjected to the auditor's examination. The auditor, however, does not evaluate all auditee controls but must choose for examination those controls which relate to items which are of "material" concern to the recipient of the audit report.

Table 3

Typical Control Objectives

A) Process Control Objectives

| Input* Control Objectives | Conversion (Transformation Process)* Control Objectives | Output* Control Objectives |
|--|---|--|
| Controls to ensure: | Controls to ensure: | Controls to ensure; |
| <ul style="list-style-type: none"> - Selection and maintenance of suitable infrastructure, resources and raw materials; - Appropriate handling of demands for service. | <ul style="list-style-type: none"> - Prevention or detection of accidental errors in conversion of input to output; - Prevention or detection of fraudulent activities during the conversion of input to output; - Security of conversion process to ensure continuous operation; - Compliance with authorities and prescribed policies and procedures. | <ul style="list-style-type: none"> - Completeness of output; - Accuracy or freedom from error in outputs; - Timeliness and appropriate distribution of output; - Compliance with specifications from higher authority. |

B) Results Control Objectives

| Economy Control Objectives | Efficiency Control Objectives | Effectiveness Control Objectives |
|---|--|--|
| Controls to ensure that resource acquisition and maintenance are done economically. | Controls to ensure that output achieved for input supplied is optimal. | Controls to ensure that entity output is according to plans and has the desired effects. |

* Refer to Table 1 (page 214-217) for definitions.

In internal auditing "... an item would be considered material if an error in it (or its complete omission) would cause prudent, intelligent information users to change decisions that they might otherwise make on the basis of information provided by and about the auditee".²¹

The practical problem for internal auditors is to determine whether errors would significantly influence the decision-making process of users should they be disclosed. Failure to establish a proper materiality limit will result in the gathering of audit evidence and the reporting of audit results at an inappropriate level of detail. A threshold limit which is set at too high a level of detail will result in audit report comments which are too general to be of significant use to the reader of the audit report. Threshold limits which are too low can result in over-auditing and the cluttering up of audit reports with information at an overly precise level of detail.

Internal auditors must use their professional judgment when establishing the level of detail covered by their review. Table 4 lists a number of factors the auditor may wish to consider when determining which items in the system under review constitute material ones and consequently require inclusion of their related controls in the predetermined control model.

It should be recognized that many controls are useful though not deemed material by the auditor. The auditor's viewpoint on the significance of controls incorporates the deputy minister's perspective. Clearly, lower-level managers establish controls which are necessary for the proper performance of their function. Care must be taken, therefore, in avoiding the assumption that when a control is not deemed material by the auditor, it serves no useful purpose and should be discarded. There will often be many useful controls which may not be considered significant from an audit standpoint.

21 Edds, op. cit., p. 144.

Table 4

Materiality Guidelines

The following represent factors the auditor should consider in determining whether items under review are material. The auditor, with appropriate input from users, should review items in terms of whether they involve:

- known or probable management issues or concerns;
- areas of particular on-going concern identified in previous audits;
- questions of non-compliance with financial regulations;
- fraud or other irregularities;
- potential areas of uneconomical or inefficient operations;
- uncertainty concerning the entity's knowledge of the effectiveness of its programs and deficiencies in the entity's procedures to evaluate effectiveness;
- a program or activity of particular interest because of its nature or relative size, and its importance or impact;
- significant new or expanded programs or activities;
- unusual program management characteristics, such as restrictions or freedoms in carrying out functions; and
- financial, human and physical resources of particular interest because of their nature and importance.

It is likely that where an item involves at least one of these factors, it will be "material" to the user of the audit report. The predetermined control model should include all controls relating to material items.

ii) Criteria for Control Design and Effectiveness

The predetermined control model should contain criteria relating to what constitutes the proper design for controls established to achieve the control objectives selected by the auditor for examination. In addition, indicators which would identify effective operation of the controls under review should be included in the auditor's criteria. This information forms the basis of the auditor's evaluation of the adequacy of controls (the method for this evaluation is discussed in Section Four).

In terms of control design criteria, the auditor should first determine what type of control would be appropriate given the control requirements of the underlying system. In Section Two, alternative design strategies for control systems were discussed (these are summarized in points 2 and 3 of Figure 7, page 206). The auditor must choose from the options available those control designs that are appropriate to the system under review and reflect the need for such control designs by establishing them as criteria within the predetermined control model.

The criteria for control design should also provide the basis for reviewing whether all necessary elements in a control system exist (refer to Figure 6, page 204) and are operating properly (e.g. performing adequately the functions normally associated with each element or as prescribed by laid-down policies and procedures).

Table 5 illustrates an approach that could be taken in the development of criteria relating to control design.

The final aspect of the predetermined control model to be developed are criteria which can be used to determine the control's effectiveness. Criteria relating to effectiveness are:

- the extent to which the control objectives established by management have been achieved;
- the appropriateness of the established control objectives in the first place, given the control needs of the system under review.

The actual criteria used to measure effectiveness are often statements which relate to the types of conditions one would expect to find in the system if it were subject to proper control. With such standards for performance, the auditor would gather evidence which provides positive proof of a control's effectiveness.

Conversely, criteria may be statements relating to the types of conditions that indicate the system is out of control. Absence of evidence relating to control problems also provides indirect proof of control effectiveness.

Table 5

Development of Criteria Relating to Control Design

A. Overall Control Design Considerations

Given the nature of the specific control objective under review, provide criteria which indicate that the design of the control system should be either:

- preemptive, preventative or detective;
- open or closed to input from the environment of the system under review; identify extent;
- adaptive or corrective;
- feedback or feedforward.

B. Completeness of Control and Proper Performance by All Control Elements

- identify the existence of the elements of a control system: control object, detector, reference point, comparator and activator
- provide criteria which can be used to assess the adequacy of the function performed by each element; consider:
 - i) control object
 - identify the aspects of the system's processes and results that should be monitored (consider the dimensions of quantity, quality, timing and cost or other attribute for which there is a predefined requirement);

Table 5 (Cont'd)

Development of Criteria Relating to Control Design

ii) detector

- identify the criteria which indicate the manner by which information on what is actually happening in the system under control should be gathered;

iii) reference point

- identify the standards or benchmarks that should be used in the control system to determine acceptable system processes and results;

iv) comparator

- identify the criteria which indicate the manner in which actual performance in the system under control should be compared against desired performance;

v) activator

- identify the criteria which indicate the manner in which deviations of actual system performance from desired performance are to be acted upon.

Greater detail on the functions of each control element were provided earlier. This information may be used to refine the criteria used to evaluate control design. Wherever policies and procedures prescribe the manner in which the above elements function, these requirements should be built into the control design criterion.

Issues Related to Developing the Predetermined Control Model

In private-sector, external financial audit practice, the problem of identifying where controls should exist and why, has been largely resolved. The following reasons have contributed to the existence of a reasonably uniform approach to defining control points and objectives relating to a financial system:

- the processes which lead to financial reports are largely prescribed through Generally Accepted Accounting Principles (GAAP) and other conventions; as such, the locations of process controls are reasonably clear and follow the prescribed rules for proper accounting practices;
- the output of the financial reporting system, the financial statements, are the output measures of the private sector organization's overall objective of surviving and earning a profit; the adequacy of management's concern for controlling results is directly observable through review of the degree to which financial results are controlled. As in the case of process controls, the determination of which results should be controlled is therefore also reasonably clear in the private sector;
- the scope of financial information systems is limited in terms of the types of activities and their complexity; consequently, an understanding of financial processes and their relationship to results can be reasonably complete and lends itself to more accurate determination of required control points; and
- it is somewhat easier in an accounting context to determine the risks or effects of missing controls; controls are meant to protect the financial interests of the firm and the effects of control weaknesses can be usually quantified in financial terms; being able to establish the effects from control deficiencies reduces the likelihood of disagreement as to the need for, and location of, controls.

While the financial control model can be largely incorporated into corresponding aspects of internal auditing, there is a lack of general agreement by public sector auditors on the process and results controls required for the broader aspects of the auditee's operations subject to the internal auditor's examination. Consequently, the degree of confidence relating to the need for, position of, and objectives of control is less tangible. Consider, for example, some of the following questions regarding the placement of controls over operational or managerial activities:

- What performance indicators should be used to determine that the organization is moving towards achievement of its goals?

For profit-based, private sector organizations, we noted that financial results were tangible indicators of the firm's ability to meet its goals. Consequently, control should be established over financial results. In the public sector, progress towards the achievement of social goals is normally more pertinent and is also more difficult to measure. Problems exist in determining what results indicate satisfactory performance and exactly how these results should be measured. These problems make the predetermination of the necessary controls over results more difficult for the auditor.

- What agreement is there as to the activities that should be performed and controlled to ensure that the desired organizational results are achieved?

Unlike accounting practice, there does not yet exist a comprehensive body of managerial principles that are generally accepted as the means by which desired outputs should be achieved. In addition, there are no management theories which provide absolute truths regarding the manner in which managers should behave. As such, the activities in the management process which should be performed and controlled cannot be fully established by reference to outside conventions or universal management principles.

It has also been noted that the risks or effects associated with missing accounting controls can be reasonably well defined. In the broader operational and managerial context, the relationship between particular processes and results is not as clear.

As such, the possibility of disagreement concerning the need for a particular practice or control may be greater given the fact that risks can be derived less precisely or quantitatively.

Despite the general reservations noted above, there exist a number of managerial and operational conventions which provide partial frameworks for establishing the types of processes and controls considered necessary to achieve desired results. In the federal government, for example, Treasury Board and departmental policies and directives establish norms for the nature and types of managerial and operational processes and controls that are expected to exist for at least some of the activities (e.g. common services like financial, personnel, etc.). In these cases, the auditor has a more concrete basis for determining what activities are necessary to achieve desired results and where process controls should be established. Outside of these areas, where managerial and operational convention do not exist, the auditor is again faced with difficult problems regarding the predetermination of necessary controls.

Summary

We have now reached a point where the auditor has some tools and techniques for the development of a descriptive organizational control model and a separate prescriptive predetermined control framework. These organizational models were developed on the basis of the systems modelling and control concepts of Section Two. As a guiding principle, the ultimate justification for any model must rest on its usefulness in aiding auditors in the performance of their duties. In Section Four, use of the control models by the auditor will be explored.

SECTION FOUR: THE AUDITOR'S USE OF CONTROL MODELS

Evaluating the Adequacy of Control Systems

The auditor evaluates the audited entity's control framework to arrive at conclusions in relation to whether:

- the results of operations are adequately controlled such that actual results compare favourably with desired results; and
- the operational process is satisfactory such that it remains capable of achieving desired results over time.

Using the modelling techniques provided in this document, the auditor will be in possession of a descriptive model of the structure and operation of the entity under review and a prescriptive model of the controls that should be operating. This modelling would essentially be completed by the end of the review phase of the audit.

In the evaluation phase, the auditor evaluates the adequacy of the control framework by matching existing controls with the predetermined control model and answering the following questions:

- Do all essential controls exist?
- Are all essential controls properly designed?
- Are the controls operating as designed?
- Are the controls effective?

The remainder of this part will discuss preliminary considerations which will aid the auditor in dealing with these questions.

Do All Essential Controls Exist?

In the auditor's predetermined control model, all necessary control points and their objectives are identified. These controls and their purposes should have been legitimized through reference to supporting authoritative sources (i.e. the controls have been mutually agreed to by managers or are supported by prescribed policies and directives). As an initial test of the adequacy of controls, the auditor would match the predetermined control model against the descriptive model of the organizational control system.

The result of this matching will give the auditor a preliminary indication of:

- missing controls at points where essential controls should exist;
- the existence of controls at points where no controls are considered essential; and
- the existence of controls at points where essential controls should exist.

Where an essential control is found missing, the auditor would determine whether any adequate compensating control exists. Where a compensating control is found the auditor would proceed to test the adequacy of its design, operation and effectiveness. Where there are no compensating controls, the auditor would perform tests to determine the cause and effects of the noted deficiency. A missing results control indicates that management has not been providing sufficient regard to ensure that actual results compare favourably to desired results. The auditor may be able to substantiate this indication through a direct review of actual results in relation to desired results. A missing process control indicates that the capability of the process to continue to produce desired results may be in jeopardy. Again, the auditor may wish to substantiate this claim by relating deficient process controls as a cause of undesirable results.

Where a control is found at a point where no control is considered essential, the auditor would likely test it from a cost/benefit standpoint.

Where a control is found at points where controls are expected to be found the auditor would proceed with tests relating to adequacy of its design, operation and effectiveness.

Are All Essential Controls Properly Designed?

In Section Three, guidelines were provided for developing criteria that can be used to evaluate the adequacy of control design (refer to Table 5). Criteria related to two aspects of design. First, evaluation focuses on whether the overall design of the control is appropriate given the nature of the control objective being sought. Second, the auditor must assess whether all elements of a control system can be identified in the control design and whether the intended functions of each element are conducive to the achievement of the control objective.

Where control design is evaluated as adequate, the auditor would proceed with tests relating to the operation of the control and its effectiveness. Inadequately designed controls would be tested in terms of the cause of the noted deficiency and its corresponding effects.

Are the Controls Operating as Designed?

The auditor's initial review of the design of controls involves the gathering of evidence relating to management's intentions of how the controls should operate. Once a satisfactory understanding of the intended control design is achieved, the auditor should accumulate evidence which proves whether or not controls, in fact, are operating as intended.

Are the Controls Effective?

In Section Three, the criteria for assessing control effectiveness were discussed. To reiterate, the auditor's primary concern at this stage of the evaluation is to determine whether the control objectives recognized by management are appropriate given the control needs of the underlying system and whether established control objectives are in fact being achieved.

Audit Evaluation and Major Work Instruments

It is beyond the scope of this chapter to discuss in detail the mechanisms of conducting an audit assignment. (Please refer to Part 1 of this Handbook, "The Internal Assignment Process" for such a detailed discussion.) It is illuminating, however, to integrate the audit approach discussed to this point with the conventional work instruments associated with audit assignments. Specifically, a brief reconciliation of the use of the Internal Control Questionnaire and the Audit Verification Program with this chapter's audit approach is needed.

Essentially, in performing an audit assignment the descriptive organizational model and the predetermined control model would be first defined in the review phase. At the outset of the evaluation phase, the auditor makes the initial comparison of the two models to determine whether all essential controls exist and whether they are properly designed. To make such a comparison, it is suggested that the narrative statements of the predetermined control model be converted to question format. The sum of questions relating to the existence and design of controls would be the Internal Control Questionnaire.

Auditors determine from management and the previously prepared descriptive model, answers to the questions posed on the Internal Control Questionnaire. Based on these answers, audit verification programs are devised.

Audit programs specify the procedures to be employed when gathering sufficient, valid and relevant evidence necessary to support audit conclusions about the adequacy of controls. Essentially, audit programs can be designed according to two formats. Where deficiencies arise in the existence or design of controls, audit programs are established to determine the causes and effects of such deficiencies. Where existence and design of controls appear adequate on the basis of applying the Internal Control Questionnaire, the audit program is designed to further test the operation and effectiveness of controls. Should deficiencies be noted in controls as a result of performing these latter audit program tests, the auditor would perform additional audit tests on the causes and effects of these noted weaknesses.

The use of audit work instruments as described above is illustrated in Figure 12.

AUDIT PROCESS ACTIVITIES AND MAJOR WORK INSTRUMENTS

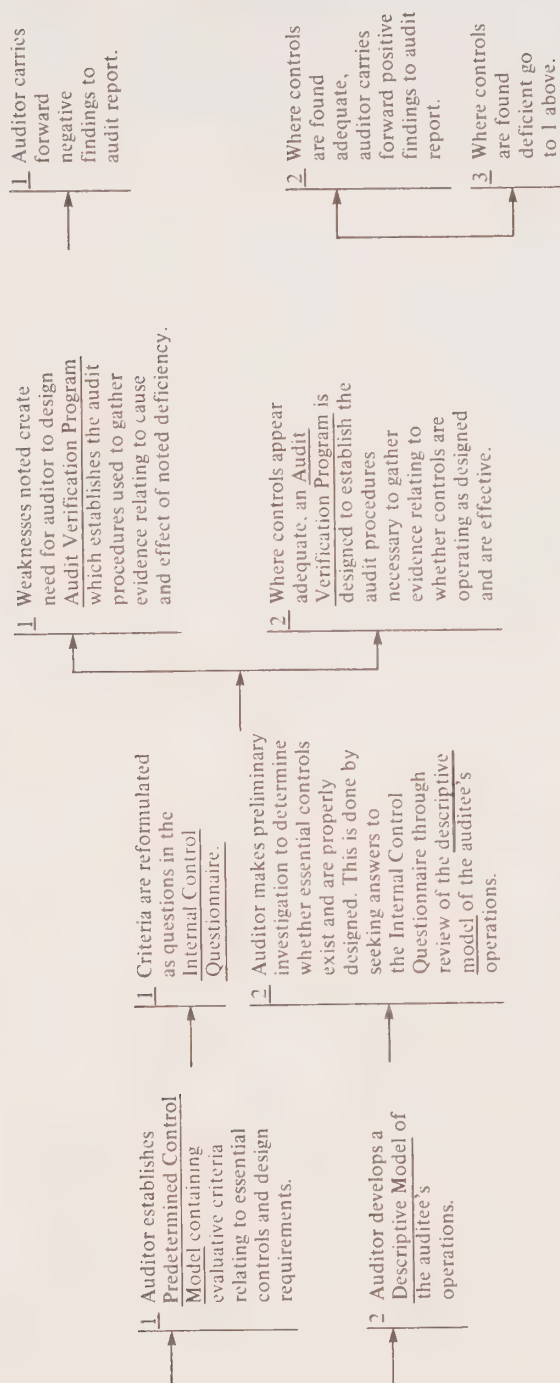


Figure 12

Summary

Section Four focuses on the use of the descriptive and prescriptive models developed in Section Three. These models provide the basis of the auditor's assessment of the adequacy of controls. Prescriptive statements about what controls should exist and how they are to be designed are compared to descriptions of what is actually occurring within the auditee's operations.

CONCLUSION

Few auditors would dispute that an understanding of the concept of control and its application to organizational activities are central to an effective audit process. While agreement exists as to the importance of control, an explanation of what it is and how it is to be audited is generally not available in the literature written for public sector auditors.

The lack of information on auditing controls may have contributed to the existence of a number of different internal audit approaches to the evaluation of the management control framework. While a certain amount of experimentation in determining an approach to auditing controls is necessary given the newness of broad-scope auditing in the public sector, eventually audit practices must be reconciled to a valid conceptual basis if auditing is to retain its identity as a credible and useful function. This document has been prepared to provide the initial reconciliation of control theory to broad-scope auditing. To the extent that it has achieved this purpose, it should serve as a basis for deriving a consensus in the internal audit community as to what it means to audit controls.

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CHAPTER THREE

MANAGEMENT CONTROL: CONCEPTS AND PRACTICES

INTRODUCTION

The purpose of this chapter is to describe the relationship between management, particularly management control, and modern (broad-scoped) internal auditing.

The material presented here builds on existing, well known management theory and practice and attempts to extrapolate it to the control design and audit domains. It builds a bridge between management's controlling function and general control theory, and between management control and modern internal auditing.

Although controlling is generally recognized as one of the components of the management process, there is somewhat less agreement on what management control actually is.

This chapter will begin by discussing the importance of management control to both managers and auditors. It will then continue with a discussion of both management control as an entity and controlling as a process, in terms considered most useful to the practices of management and auditors alike; the various roles of management will be discussed in terms of their respective contribution to management control; the dimensions of management will then be explored; and finally, approaches to auditing management processes and results will be elaborated.

SECTION ONE: MANAGERS, AUDITORS AND MANAGEMENT CONTROL

In order to set the context for the discussion of management control concepts it is necessary to establish, at the outset, why control is important to both managers and auditors and what it is about controls that we most need to be aware of.

The Importance of Control

Management literature generally recognizes control as an essential role or function of managers or management respectively (see Table 1). However, there is less general agreement on what control includes, except that it has to do with ensuring that goals or objectives set by the organization are achieved. Since a manager's success or failure is typically judged by the degree to which organizational objectives/goals are achieved, it is clear that whatever form control takes it is of crucial importance to management.

Table 1

A Representative List of Management Functions¹

| | |
|--------------------------------------|-----------------------------|
| Dale (1969) | Koontz and O'Donnell (1980) |
| Planning | Planning |
| Organizing | Organizing |
| Staffing | Staffing |
| Direction | Leading |
| Control | Controlling |
| Innovation | |
| Representation | Longenecker (1964) |
| Greenwood (1965) | Planning |
| Planning | Organizing |
| Decision Making | Directing and Motivating |
| Organizing | Controlling |
| Staffing | Massie (1964) |
| Direction and Leadership | Decision Making |
| Controlling | Organizing |
| Gross (1968) | Staffing |
| Decision Making | Planning |
| Communicating | Controlling |
| Planning | Communicating |
| Activating | Directing |
| Evaluating | Mintzberg (1973) |
| Johnson, Kast, and Rosenzweig (1967) | (Roles of Chief Executive) |
| Planning | Interpersonal |
| Organizing | Figurehead |
| Control | Leader |
| Communication | Liaison |
| Carleson (1960) | Informational |
| Planning | Monitor |
| Organizing and Staffing | Disseminator |
| Direction | Spokesman |
| Leadership | Decisional |
| Coordination | Entrepreneur |
| Controlling | Disturbance handler |
| | Resource allocator |
| | Negotiator |

¹ Augmented list. From Miner, John B. The Management Process - Theory, Research and Practice, New York: The MacMillan Company, 1973, p. 48.

Table 1 (cont'd)

A Representative List of Management Functions²

Drucker (1974)

Planning
Organizing
Integrating
Measuring

Voich and Wren

Planning
Organizing
Controlling
Administering

Fayol (1929)

Planning
Organizing
Commanding
Coordinating
Controlling

Newman, Summer, and Warrent

Organizing
Planning
Leading
Controlling

The role of the internal auditor is to provide advice to management on the performance of all its major or significant managed operations.^{3, 4} The internal auditor then is interested in control from three points of view:

- As an adviser to management, on the performance of its organization, it is desirable that the auditor be able to see the world through the auditee's (i.e. the manager's) eyes. Since control is the manager's window on the organization's performance the auditor will wish to keep that perspective in mind;
- The auditor is expected to comment on the state of the auditee's control framework.^{3, 4} It follows that the auditors' superiors will, presumably, be evaluating the auditors on how well they perform that crucial activity. Control then, is of interest to the auditor as a determinant, i.e. as one (not necessarily the only) measure of the auditor's effectiveness; and
- The auditor as a manager of audit operations, is also concerned with performing the audit task in the most efficient way possible. Given that we define control in a way that makes it visible as a distinct entity capable of being characterized, and therefore evaluated, it will be demonstrated that an audit is most efficiently performed by auditing through the control framework. As in the case of external auditing, detailed (substantive) testing takes the auditor beyond the examination of controls, into the examination of the operations being controlled and of the results being achieved. However, as in the case of external auditing, much time and effort may be saved by evaluating the framework of essential controls before deciding on the extent of testing required.

3 Treasury Board of Canada, Standards for Internal Audit in the Government of Canada (see Standards 1 & 2).

4 The Institute of Internal Auditors, Standards for the Professional Practice of Internal Auditing (see Section 300, Scope of Work).

To summarize, control in general and management control in particular are clearly of considerable interest and concern to both managers and auditors. To managers, it is an important means through which they attain and maintain economic, efficient and effective organizations; and to auditors, it is a means of gaining perspective, as the main subject of their audit activity and as means which facilitates performing efficient audits.

SECTION TWO: DEFINING CONTROL

Given the myriad of definitions of control that abound in management and audit literature, it is clear that we cannot display a generally accepted version to which we could merely subscribe. The next best alternative is to adopt or synthesize a definition that is easiest to use by the two main classes of players in this discussion, namely managers and auditors.

Possible Definitions

In deciding on the most appropriate definition of control there are two (among many) provided in Webster's Dictionary⁵ which are worth noting:

1. To exercise authority over; direct; command; and
2. An instrument or apparatus to regulate a mechanism.

The foregoing definitions are of interest from two points of view:

- they suggest that both human and non-human components may be involved; and
- they imply that control is not simply an activity carried out by components which are there for some other purpose (e.g. product/service/program delivery), but rather may have unique components which are exclusive to the control itself; i.e. that a control is capable of being distinguished from the entity being controlled (i.e. differentiable).

5 Webster's New World Dictionary, Second Edition, 1976.

If a useful definition for control is to be adopted, it is necessary that both the exercise and the existence of control (both human and non-human components) be differentiable from the entity being controlled, in some manner. Given that control is differentiable, it is further necessary to demonstrate that the exercise of differentiation is worth the effort. The existence of human components does not change the nature of the discussion of control but does add considerably to its complexity.

In the following, the differentiability of both control and its exercise will be demonstrated, as will their usefulness as distinct entities/activities.

The Differentiability of Control

In any discussion of the differentiability of control, the most logical place to begin is where there is the most agreement, i.e. the exercise of control. As already noted, there is general agreement that one of the major roles/functions/activities of a manager is controlling - the exercise of control.

This control activity or process generally consists of: measuring or detecting the state of the entity that is being controlled; comparing the results with some reference point or performance indicator (desired state: standard, specification, plan, etc.); noting the deviation, if any; analyzing the deviation for size (Is it greater than the threshold for corrective action?) and nature (Is the deviation one of inadequate/inappropriate performance or inadequate/inappropriate reference point?); determining what action, if any, needs to be taken to correct the deviation; and, taking the necessary action.

The next issue to be dealt with is whether there are components or elements of the organization that can be identified as the instruments through which control activities are exercised, and further, whether they are sufficiently distinct to be identified as a sub-system of the host organization.

For those operations/delivery systems that have automatic controls built in (e.g. in EDP systems or a numerically controlled manufacturing machine), there is little difficulty in identifying the elements of the relevant control system⁶. (See Figures 1 & 2 for examples of open and closed generic control systems, in pictorial form respectively). This is true even if some of the components serve more than one purpose (i.e. both delivery system and control system requirements), simply because they are physically identifiable and subject to characterization in terms of their elements and relationships. It follows that if they can be identified and characterized, they can also be evaluated for existence and for their effectiveness.

Those control activities that are performed by humans (of most interest to us are those performed by managers) are more difficult to identify and characterize because some, or all, of the control process is performed by the same control mechanism, namely the manager.

In this case, not all the control elements are readily differentiable from each other, nor are the control activities readily differentiable from the other managerial activities, except perhaps in terms of output. However, to the degree that the manager relies on other mechanisms for some elements of the control system (e.g. on some machine, to detect errors; on a management information system to assemble and present reports, which compare actual to desired performance and indicate deviations) at least some of its elements and their corresponding operations can be separately identified, characterized and evaluated.

The more complex the organization being managed, the more managers resort to external mechanisms for carrying out their function. This typically consists of delegation of responsibilities, along with associated authority, to subordinate managers and using more formal management planning, organizing, directing and controlling methods and techniques (e.g. corporate policies; specified planning processes which result in formal plans; formal systems and procedures; and, formal management information systems).

6 Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors" for a detailed discussion of control concepts.

CLOSED CONTROL SYSTEM

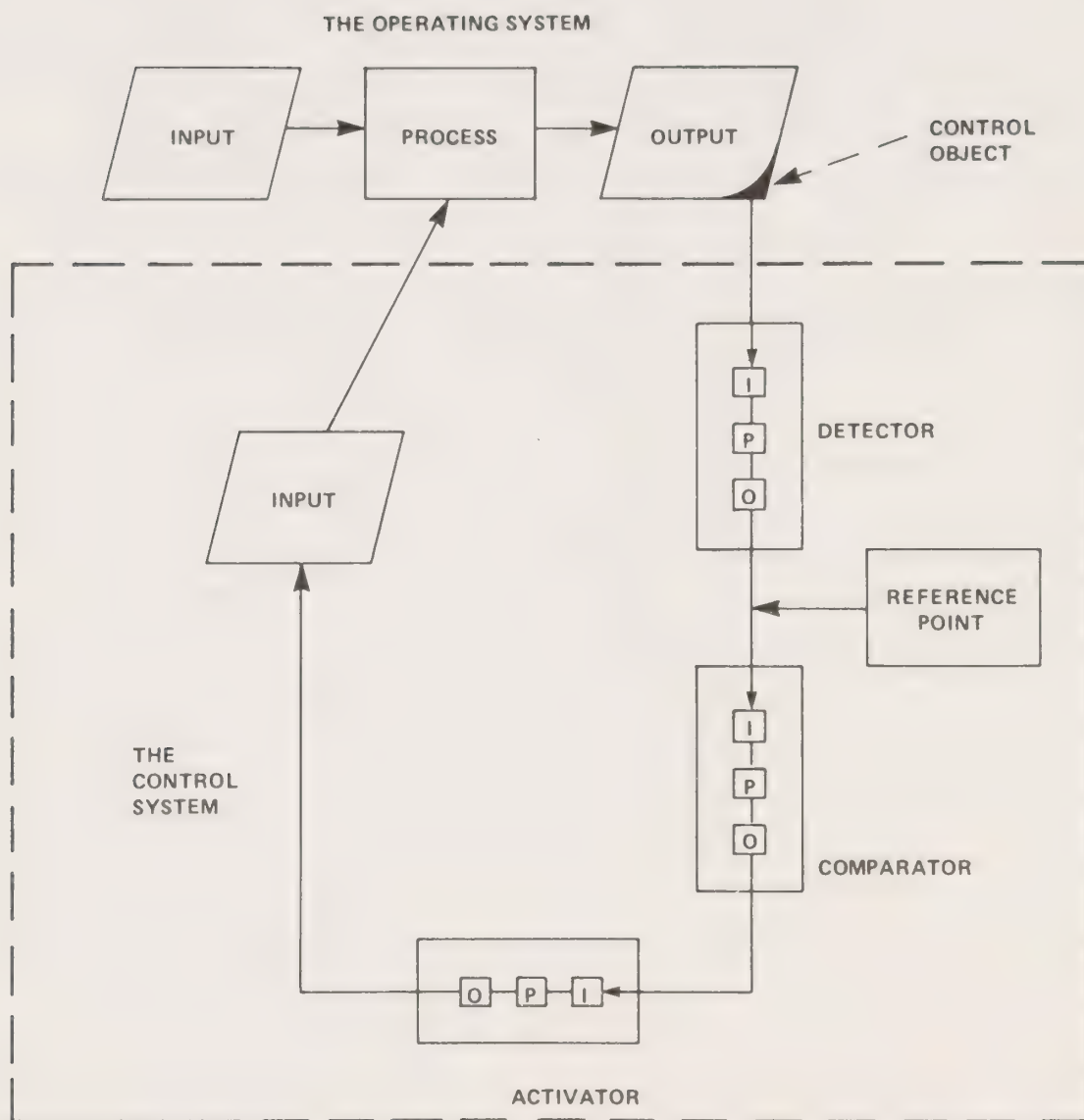
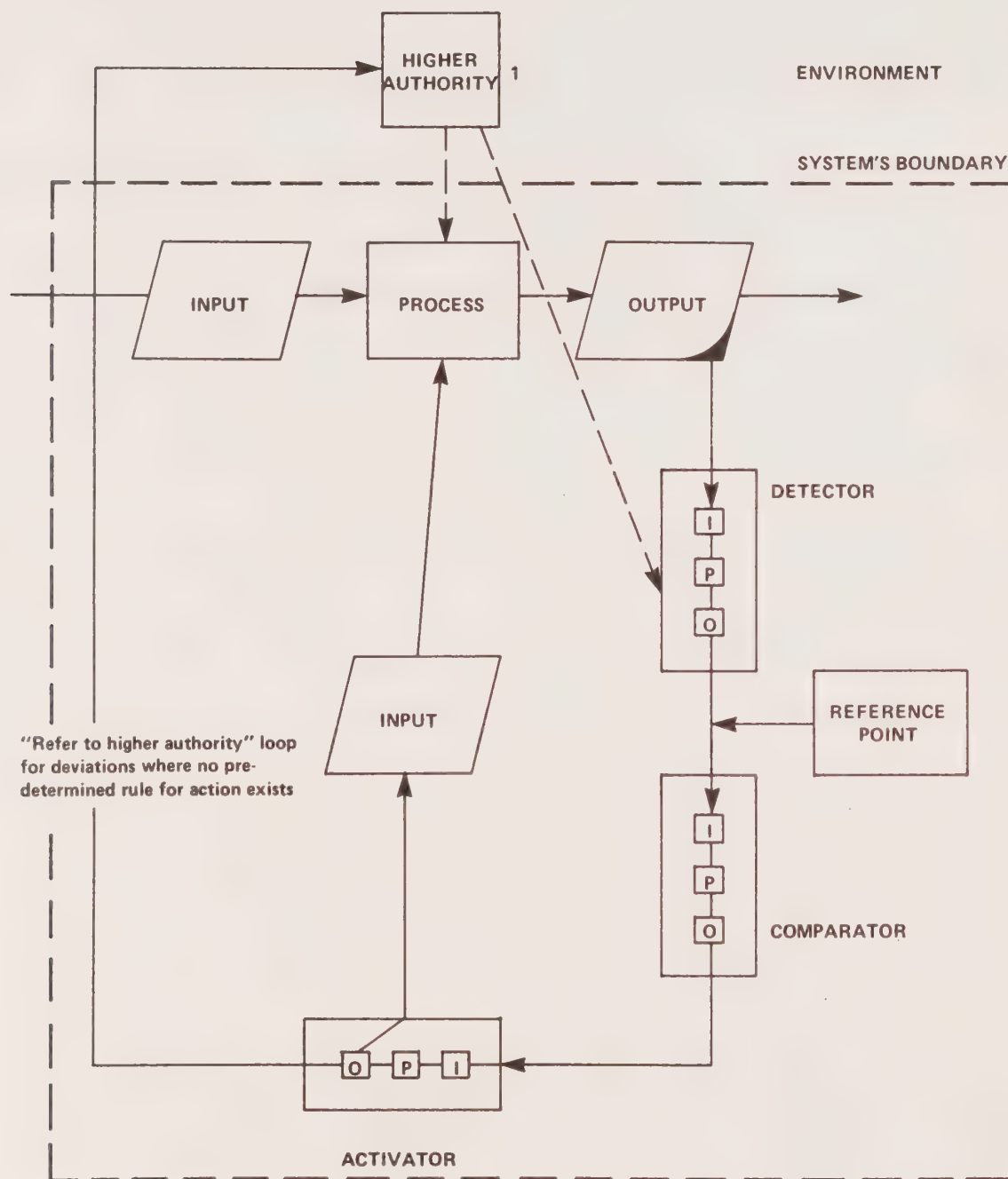


Figure 1

OPEN, ADAPTIVE CONTROL SYSTEM



1. Higher authority may adjust processes of the operating system or any of the control subsystem elements

Figure 2

The more complex the organization (e.g. larger; more complex delivery systems; more decentralized) the more complex, and therefore differentiable, its control systems. However, except in the simplest organization (e.g. sole proprietor) it is likely that at least some elements of the control system will be differentiable, even in relatively small and uncomplicated organizations.

In summary both the exercise of control and the control system are differentiable in most cases of interest to both managers and auditors (taking into account that the degree of interest or concern is proportional to the risk of not accomplishing the results intended). The next, and most crucial, test for deciding whether or not to focus on differentiated control systems is the test of utility, i.e. is it worth the effort?

Is a Differentiated Control Useful?

Anyone who has studied, designed, or used control systems extensively readily recognizes that what constitutes a control system (i.e. its components and their relationships) is a function of an individual's perspective. Since managers often exercise their roles, including controlling, at more than one level and across a number of processes (both operational and managerial), and since they are generally aware of controls in terms of their physical manifestation, rather than their conceptual nature, it is not surprising that many of them are hard pressed to give one definitive definition of a control or control system. What exists in any medium to large organization is a control framework. Given that there is a division of labour between support groups (e.g. finance, personnel, EDP) who develop and/or operate some portions of the framework, and line managers, the individual manager may not even be aware of all the components of that framework.

In what follows, arguments will be made to persuade the reader that a differentiated control system is useful to: managers, who use controls; systems and procedure designers/developers, who develop controls; and, auditors, who evaluate controls.

As demonstrated in Chapter 2,⁷ Part 2, Volume II of this Handbook, organizations may be portrayed as systems. This form of portrayal is useful, to managers/designers/auditors, as it allows the resultant model (system) to: be characterized fully, in terms of components and their relationships; analyzed (i.e. disaggregated from macro to micro level) for thorough study and decision-making; or, synthesized (from components into sub-systems, and then into systems), using a variety of well-known systems techniques.

Good systems analysis/synthesis practice requires that systems be capable of assembly from, or disaggregation into, components/sub-systems and their corresponding relationships, which are capable of being related to their purpose. It follows then, that identifying control sub-systems which are relatable, and therefore evaluable, according to their purpose (i.e. to control objectives) is a useful endeavour. What is also important to note is that these systems analysis/synthesis processes are equally valuable to managers, designers and evaluators (including auditors). More will be said later about how use is made of systems techniques by those three classes of users.

We next turn our attention to the issue of perspective. At the highest organizational level, the non-operating investor (i.e. someone who invests capital but does not participate in management of the firm), might view the whole organization as a control mechanism (see Figure 3). This control mechanism detects what return on investment (ROI) the portfolio of investments is contributing, compares it with the required ROI, analyzes the situation, determines whether that investment component (revenue producing organization) is likely to deliver the desired return in the future and retains or drops it from the investment portfolio accordingly.

In this case the organization itself is the lowest-level systems component that the user is interested in because he/she does not make decisions about any of its sub-systems.

7 Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors".

AN INVESTOR-LEVEL CONTROL SYSTEM

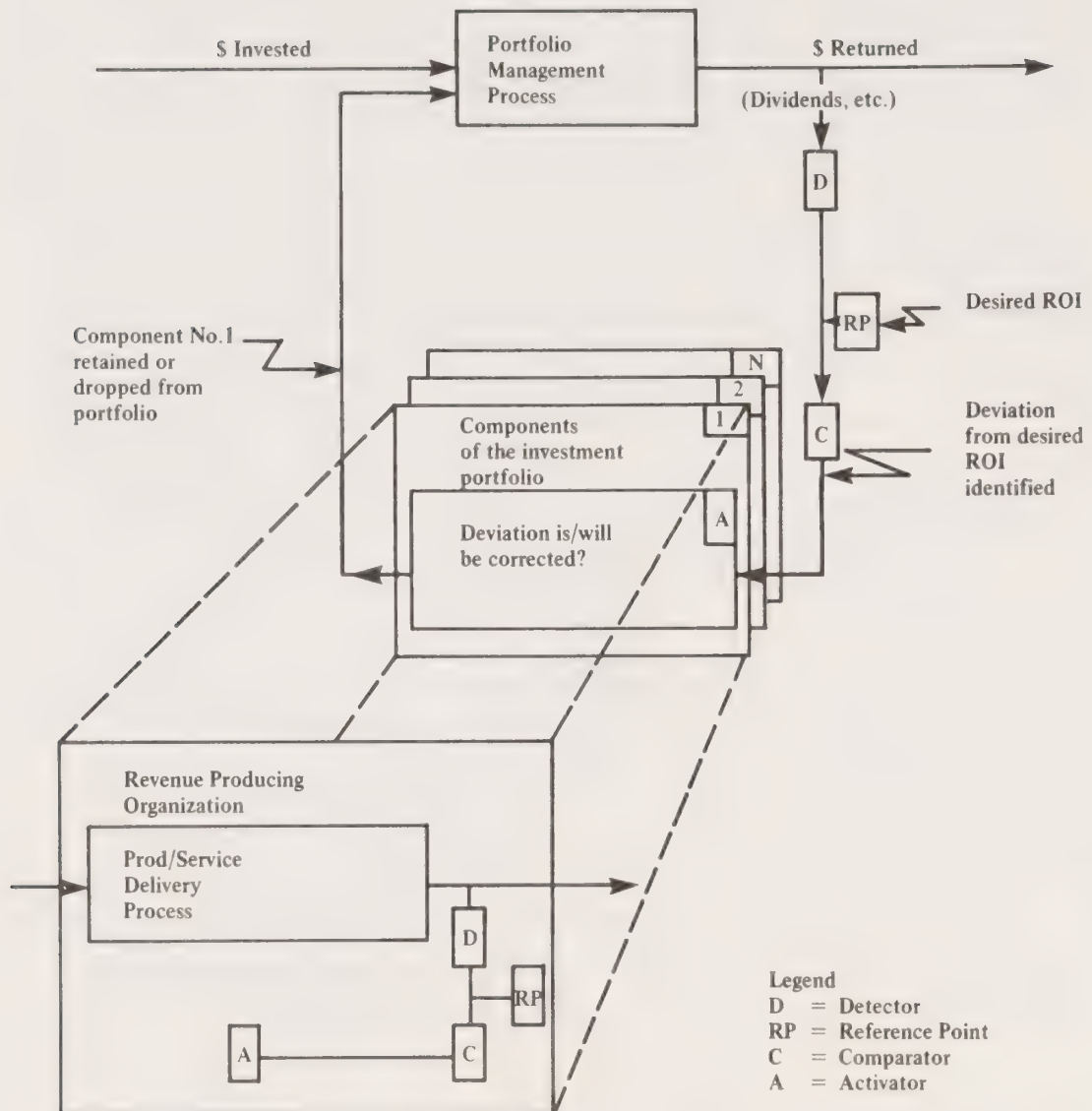


Figure 3

Decisions concerning the management of the organization as a whole are left to the Board of Directors and senior management. A useful disaggregation at this level would be such that the components of the corporate-level control system are segregated from the corporate-level delivery system, as shown on the bottom left-hand side of Figure 3.

For an organization under design, this facilitates management's design process in that it allows management to focus on both the delivery and control systems independently and to align the control process with the desired level of decision-making and with the nature and complexity of the delivery system being controlled. The segregation of the control components from the delivery system components is particularly advantageous at the design stage as it enables decision-making about the most important portions of the system, the delivery system (i.e. the *raison d'être* of the organization) to be disengaged from decisions about peripheral issues, which include control, at least at the conceptual design stage. This in turn allows for the independent determination of the design criteria for control in terms of the type and level of need, based on the risk considerations associated, as opposed to being buried in the design criteria of the system being controlled. For example, a large, complex delivery system may or may not need large, costly controls, depending on what level of risk the control system is expected to prevent or identify. The reverse situation is also possible. In the cases where the control is embedded in the controlled system it is still useful to be able to identify control components, or their dual role in case of shared components.

At the operating stage, it is useful to be able to identify the control components of the organization's systems in order to be better able to pin-point problem areas and to take remedial action on only those components requiring it.

As may be seen from Figure 4⁸, the process of disaggregation can be used repeatedly as often as required in order to identify and characterize progressively lower level components of delivery systems and their associated control sub-systems for the benefit of managers, designers and evaluators/auditors operating at those levels of detail.

8 Ibid

MODELLING USING THE TECHNIQUE OF PROGRESSIVE ELABORATION

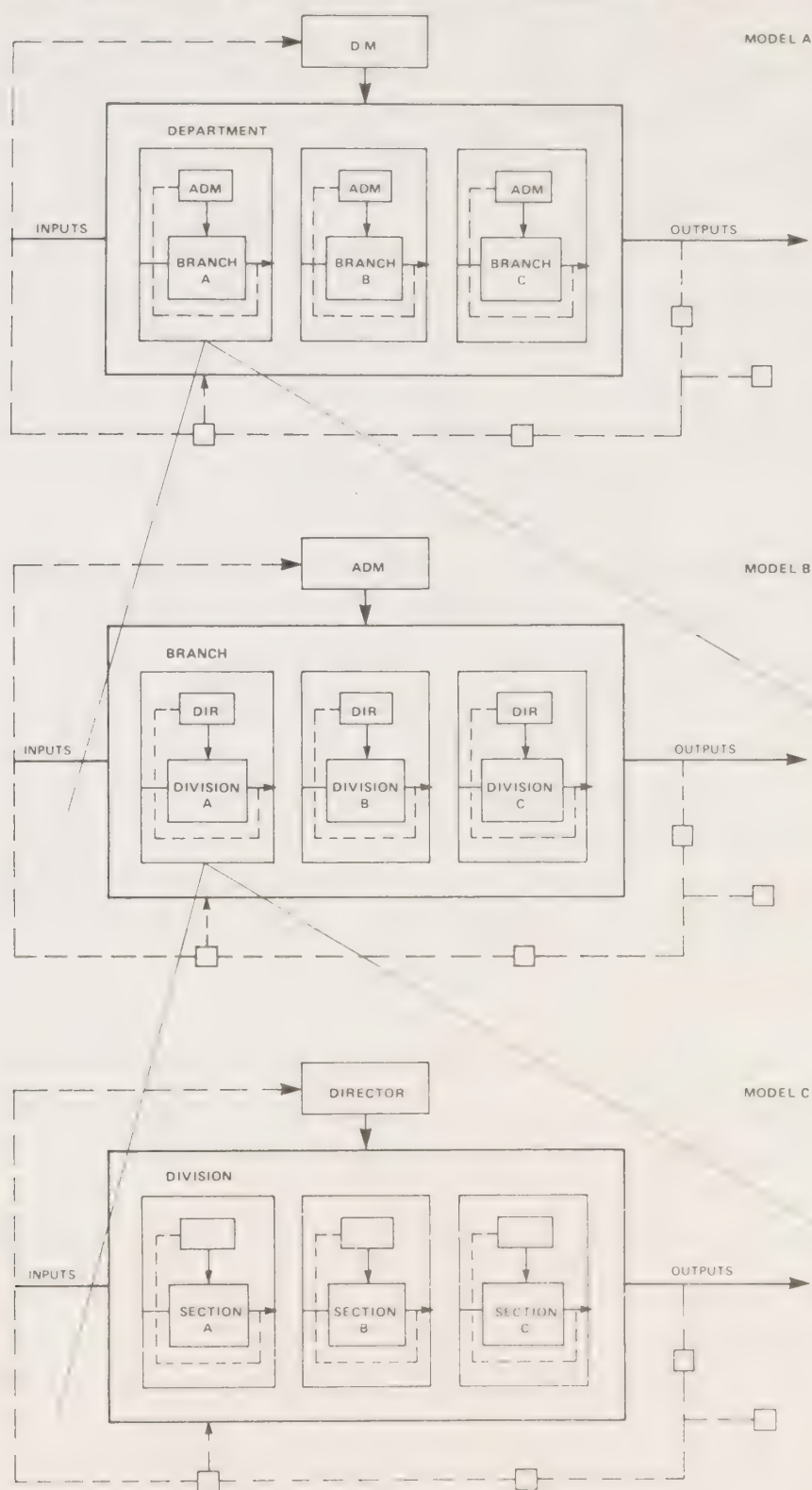


Figure 4

Definition According to Perspective

In the literature (e.g. accounting, auditing, management) control systems are referred to variously as internal control, financial control, management control, operational control, EDP control, production control, etc. In most cases the apparent inconsistencies in the above terminology can be explained in terms of the perspective taken.

To an external auditor in the private sector, referring to the controls of interest as financial controls would seem to be an unwarranted and unnecessary restriction. After all, at the corporate level of the organization particularly for revenue producing organizations, financial control is internal control. However, at levels below the corporate level one might very well want to distinguish between financial-internal controls, production-internal controls, etc. Systems developers might wish to distinguish between EDP controls and manual controls and when describing the specific area of EDP controls one might wish to distinguish between general controls, software controls, hardware controls, data controls, etc. It is all a matter of perspective.

For the purpose of this discussion internal control will be used as the generic term for all organizational controls. In order to focus on, and distinguish between, operations (production and support delivery systems) and their management, two corresponding terms will be used to denote associated controls, namely operational and managerial controls or control systems. These two types of control systems will be generally treated as sub-systems of the operations or management systems that they control, such that the controlled systems along with their control sub-systems together constitute complete delivery systems.

Of particular concern in this chapter will be the management system and its associate management control system, however, as will be seen in the following two sections it is difficult to carry on any detailed discussion of management, or of management controls, without also discussing the operations being managed and their associated controls.

In summary, control sub-systems are differentiable from the delivery systems that they control, at least in conceptual terms. Furthermore, the ability to differentiate is equally useful to managers, advisers to managers (such as systems analysts/designers) and to evaluators (including auditors).

Finally, the apparent confusion over terminology, associated with control systems literature, is more apparent than real. Ultimately, there is one control framework. This framework or system, which will be termed internal control, may be sub-divided or elaborated in a number of ways, depending on the focus of attention desired, i.e. on perspective. For our purposes, we will be interested in the nature of and relationship between, two main components of internal control, namely, management control and operations control.

SECTION THREE: THE RELATIONSHIP OF THE FUNCTIONS OF MANAGEMENT TO CONTROL

The essential theme of the following discussion will be that, although the various roles of management all contribute to control, there are important reasons for making distinctions between the control function and the others. The distinction is along two dimensions. The first distinguishes between the functions of management as they impinge on accomplishment of the main purpose of the organization and the additional elements of those functions that contribute to the control function. The second dimension deals with the distinction between the terms "control" (the entity or system) and "controlling" (the exercise of control).

The Functions of Management

The Functions of Management are described in a number of ways (see Table 1 in Section One), however, they can be boiled down to three essential components: planning (to do), implementing (doing) and controlling (determining if what was planned, was in fact done), (see Figure 5).

These three essential components can be sub-divided and elaborated in a number of ways, depending on one's specific interest or concern. This accounts for the variety of views of management portrayed in Table 1. On the other hand, it is readily seen that all of the functions, typically attributed to the practice of management can be reconciled with the three-element model of Figure 5. The complicating factor, however, is that some functions, e.g. leadership, apply to all three.

How the three-element model is sub-divided into components should be determined by what portrayal will be most suitable and useful for the purpose of the sub-division.

THE MANAGEMENT PROCESS

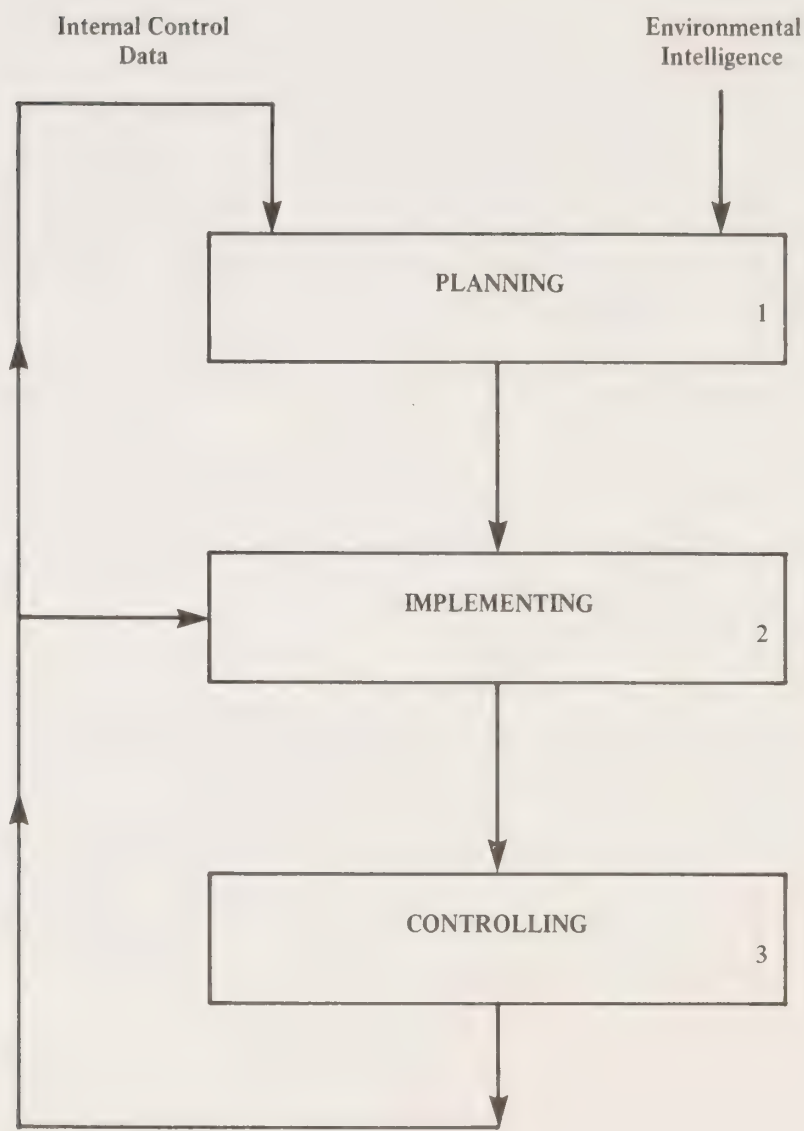


Figure 5

In this case, the purpose is to facilitate discussion of auditing the management process. Therefore, the sub-division employed in this chapter is such that components are: readily distinguished in terms of controllability; are inclusive and mutually exclusive; and, are amenable to systematic, progressive elaboration into sub-components for purposes of detailed analysis. Although the sub-division is performed for the benefit of evaluators/auditors, managers and control systems designers will find it equally useful, as their interest in effective control is, or should be, at least as strong as that of the auditor. Also, in order to minimize confusion, the detailed model used in this chapter is reconciled with the model presented in Treasury Board's "Principles For The Management ..." ⁹

In the planning stage, although planning for individual development oriented projects and for on-going operations may start out independently, the resulting plans are ultimately consolidated into one corporate plan. Therefore, the planning element is not sub-divided at this level of representation (see Figure 6).

In discussing the implementing stage, recognition is given to the fact that there are two broad classes of implementation; one which represents the on-going management of existing delivery systems (operations; both processes and structures) and a second one which represents activities associated with the management of delivery system development and installation.

The implementing function is sufficiently different for those two broad classes of activity that it is worth distinguishing them at the outset. There are several reasons for this. First, the development process, typically used in the organizing function, is expected to be carried out in ways that are explicitly (particularly in large organizations) distinct from the production processes employed for on-going operations. Second, the skill set required for these two classes of activity are quite different. Finally, the literature often mixes the two, thus losing the opportunity to explicitly recognize that those two classes of activity operate by different rules.

9 Treasury Board of Canada, Principles for the Management of the Public Service of Canada.

THE MANAGEMENT PROCESS

(For two classes of activities)

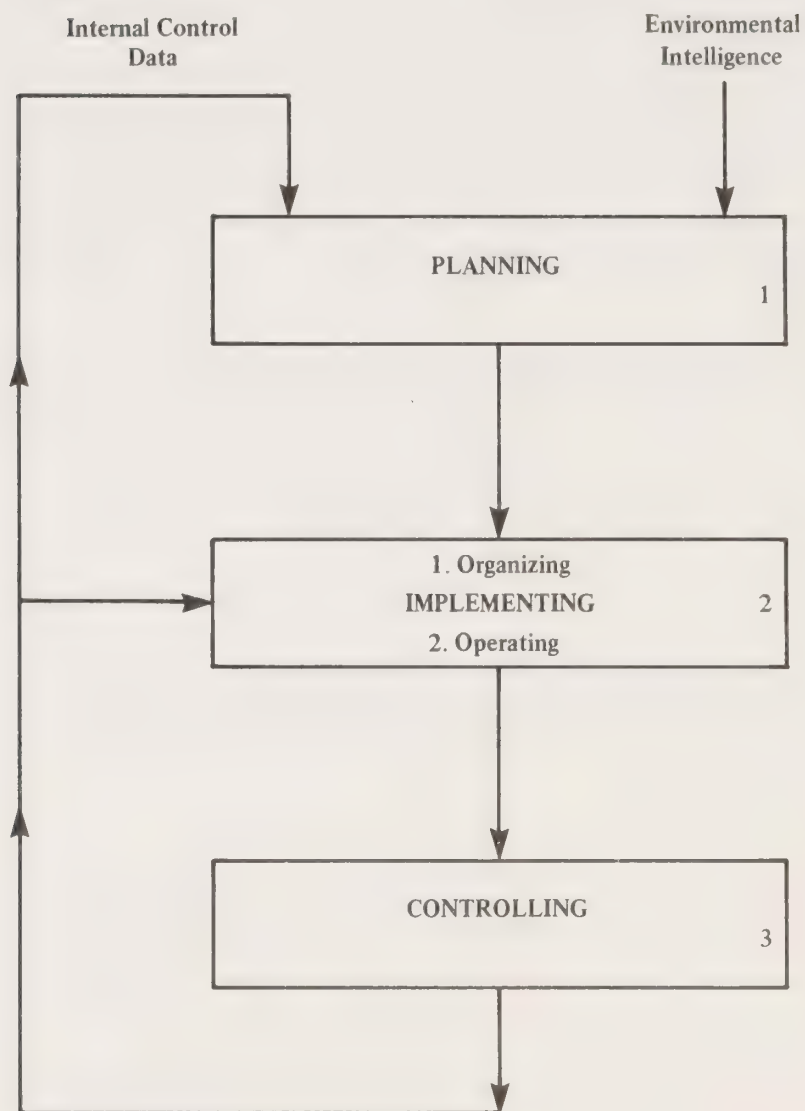


Figure 6

To the degree that the development process is different from the production processes of on-going operations, the associated controls, and therefore the controlling functions, will also be different. This is because controls are normally designed to match the nature, extent and risk potential of the process being controlled.

For the above reasons, the management of development activities and on-going activities will be portrayed (see Figure 7) and discussed separately.

The foregoing discussion clarifies one function commonly found in management literature, namely, "organizing". This leaves a number of others unaccounted for, as leading, directing, motivating, coordinating, communicating, negotiating, decision-making, staffing, allocating resources, innovating, representing, activating, commanding, integrating, measuring, and evaluating. Since this list is multi-level and overlapping it will be helpful to structure it such that they can all be taken into account in the most efficient fashion. The structure suggested is displayed in Figure 8 and Table 2 and/or elaborated in Table 3.

As may be seen from Table 3, when the common management functions/activities are displayed linearly, i.e. in consecutive order, the resultant list reconciles completely with that of the Treasury Board's "Principles for the Management..." document.¹⁰ However, for purposes of facilitating the discussion of management control, the matrix form of display in Table 2 is more informative and will be used in the following sections.

¹⁰ Ibid.

THE MANAGEMENT PROCESS

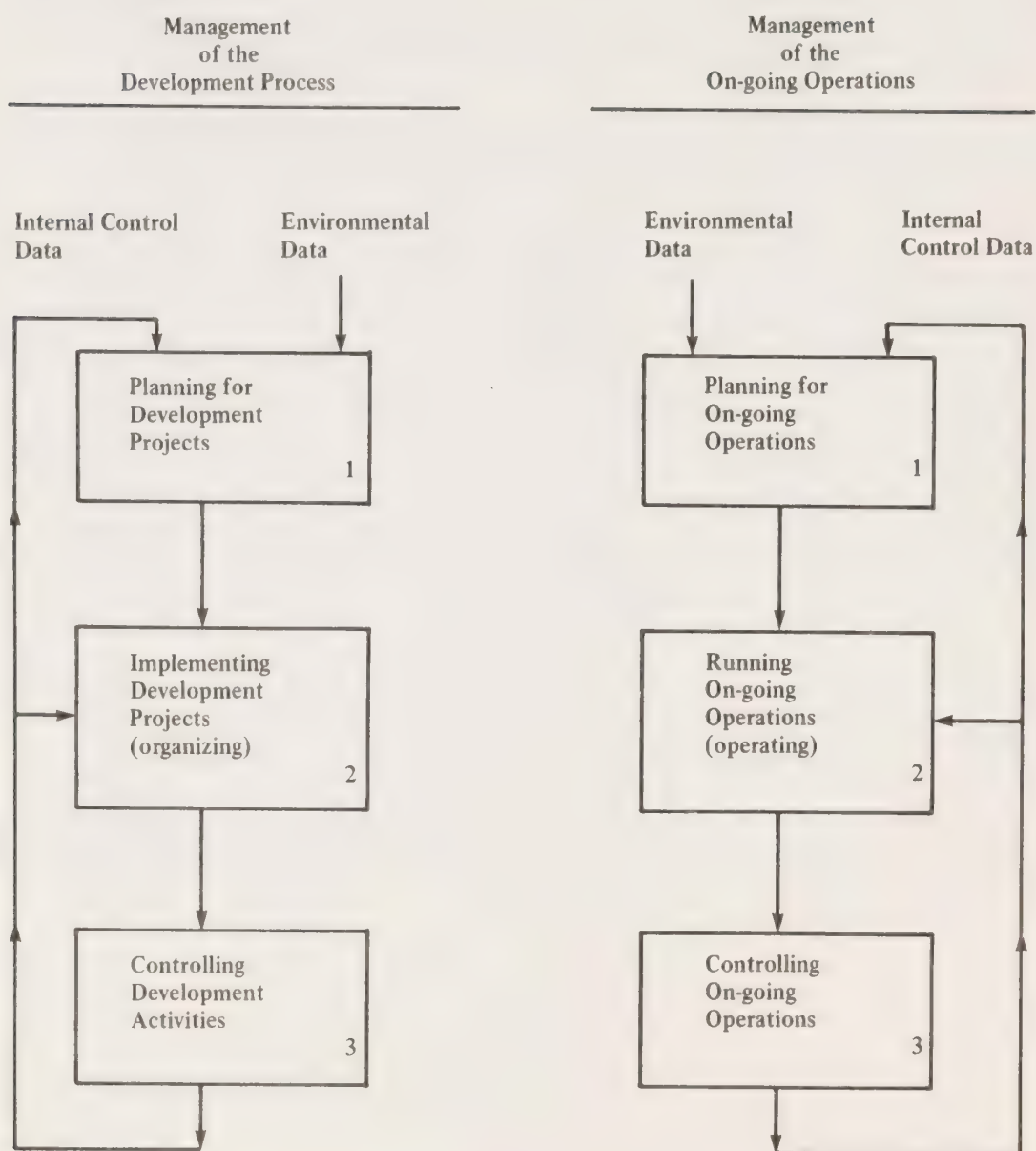


Figure 7

THE MANAGEMENT PROCESS

(Main activities complete with common elements)

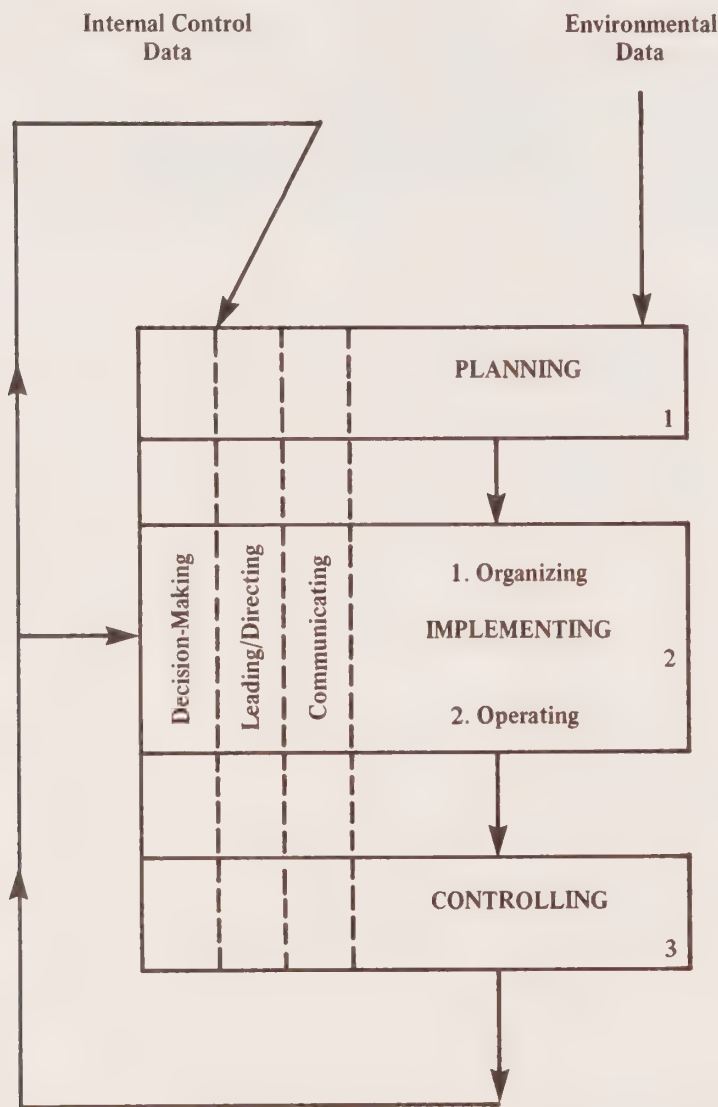


Figure 8

Table 2

Management Functions: their Relationship

| Management Functions which are common to all the basic functions | Basic (unique) Functions | | | |
|--|--------------------------|--------------|-----------|-------------|
| | Planning | Implementing | | Controlling |
| | | Organizing | Operating | |
| Leading/Directing | x | x | x | x |
| Communicating | x | x | x | x |

Table 3

Management Functions: Enumeration of Components

| <u>Basic Functions</u> | <u>Unique Components</u> |
|-------------------------|--|
| 1. Planning | <ul style="list-style-type: none">• Strategic planning• Operational planning<ul style="list-style-type: none">- long term- current year• Budgeting |
| 2. Implementing | |
| 2.1 Organizing | <ul style="list-style-type: none">• Organization development• Delivery system development<ul style="list-style-type: none">- legislation- policies- systems and procedures• Acquiring resources<ul style="list-style-type: none">- staffing- contracting- purchasing• Allocating resources• Developing resources |
| 2.2 Operating | <ul style="list-style-type: none">• Operating delivery systems• Maintaining delivery systems |
| 3. Controlling | <ul style="list-style-type: none">• Detecting and measuring performance• Comparing actual performance with desired performance• Analyzing the deviation and executing corrective action |
| <u>Common Functions</u> | |
| 4. Leading/Directing | <ul style="list-style-type: none">• Motivating• Guiding• Commanding• Activating• Coordinating• Integrating• Negotiating |
| 5. Communicating | |
| 6. Decision-making | |

The Relationship of Management Functions to Controls

The management functions that contribute most to controls as entities (systems) are planning and implementation (specifically organizing). The general relationship can be best portrayed in tabular form (see Table 4). No distinction is made at this point between operational and management controls as managers have responsibility for the development of both.

The planning function's most important contributions are in two areas, planning for the control system (control elements and the linkages between them) and identification of the decision rules for performance criteria, deviation selection criteria and decision rules for corrective action.

The two areas of concern are not independent, as the nature and extent of the criteria or decision rules chosen will influence the design of the control components that they populate. For example, a comparator that is expected to react to only large deviations (has a very tolerant selection threshold) will not have to be as sensitive or delicate as one that is expected to identify fine distinctions between actual and desired performance.

As a more specific example, a comparator that detects deviations at the dollar level is more sensitive than one that only reacts to deviations over ten thousand dollars, in a budget control system. In the former, the system will have to store data in dollars and cents in order to be able to round deviations to the nearest dollar for comparison purposes; in the latter case, data need be stored only in more macro form, that is the nearest thousand dollars.

The control element most extensively influenced by the nature and extent of decision rules is the activator element. This is because there are usually a number of possible causes for any one deviation. If the system is expected to react to material deviations in automatic or standard ways then the corrective mechanisms may become quite numerous and complex. An example of this is the numerous error routines typically designed and built into EDP-based systems.

Table 4

Relationship between Management Functions
and Controls

| Control Elements | Management Functions | |
|------------------------|--|--|
| | Planning | Implementing (Organizing) |
| • Reference Point (RP) | - Goals, objectives, targets, standards, performance indicators | |
| • Detector (D) | - Plans for development of an appropriate measurement device | - Development and installation of measurement mechanisms |
| • Comparator (C) | - Plans for development of a comparator, including a decision rule for what constitutes a material deviation | - Development and installation of means of comparing actual performance to desired performance |
| • Activator (A) | - Plans for development of the activator, including decision rules for corrective action | - Development and installation of decision rules for dealing with deviations (analysis, corrective action) |
| • Information System | - Plans for linking the control elements | - Development of the feedback path (information system) |

As may be seen from Table 3, the organizing sub-function operationalizes the plans for the required controls systems. Specifically, it sees to the acquisition and allocation of appropriate resources, and to the design, development, construction, testing, conversion and introduction of the planned systems. It also operates them until such time as they are turned over to operating personnel, at which time they become integrated into on-going operations (delivery systems).

Although not shown in Table 3, the organizing (development) process is subject to controls that ensure that it is carried out in the manner desired, and also produces the results desired by management, as would be done for any other process. In planning and developing control systems, the common management functions are exercised in ways appropriate to the nature of the activities being carried out. In this case the requirement for leadership/direction is generally more technically oriented (e.g. EDP, public administration, law) and specific as to area of endeavour (e.g. systems design, policy development, development of legislation) than in the usual on-going operations. Taking the skill level and object of attention into account, the activities, particularly the people carrying them out, need the usual motivation, guidance, direction, coordination, etc. Similarly, communication, as always, will play as important a role as it does in any human endeavour.

The Relationship Between Management Functions and Controlling

Controlling, as a function, is the process or activity of using the control system, to the degree that it exists, to detect and analyze deviations of actual from desired performance and to take corrective action. The contribution of other managerial functions to controlling is displayed in Table 5.

There are two broad categories of controlling activities; those executed by managers and those by non-managerial staff. The two categories of controlling parallel the two categories of controls, namely managerial and operational.

Although this chapter deals primarily with management control it is not possible to segregate the discussion completely as managers participate in both categories of controlling activity.

Table 5

The Relationship Between Management Functions and Controlling

Management Functions

Controlling Activities

| | |
|-------------------|--|
| Controlling | <ul style="list-style-type: none">- The main process of using the control system to detect deviation of actual from desired performance, analyzing the nature and extent of the deviation, determining and executing corrective action |
| Decision-making | <ul style="list-style-type: none">- Deciding on timing and frequency of controlling activity- Deciding on importance of the deviation- Deciding on corrective action |
| Leading/Directing | <ul style="list-style-type: none">- Executing controlling activities |
| Communicating | <ul style="list-style-type: none">- Used while executing controlling activities |

Operational controls are generally executed by non-managerial staff, except for those cases where the deviation detected is beyond the scope or capability of the control. In the latter situation the problem is referred to higher authority, namely management. The level of management eventually involved will depend on the gravity of the problem. If a new decision rule is required, it may be supplied by operational management. A more serious problem, involving either the control system or the delivery system being controlled may be referred to progressively higher levels of management until a level is found with the responsibility and authority to deal with it.

In the case of managerial controls, the manager executes all the steps that are not automated. There are two aspects of managerial control, however, that complicate the issue. One is the fact that much of the day-to-day managerial control is exercised ad hoc and informally; that is, some or all of the control system's elements are indistinguishable from the manager. In this case the control process may or may not be visible at the time of execution and is typically not visible after the fact. The results of the exercise of control are more likely to be visible to an observer only if the decision was made that corrective action is necessary, and if the corrective action decided upon and executed is external to the manager.

The second aspect has to do with the distinction between the existence of control mechanisms and the exercise of control. It is possible for a control system to be dormant, and largely invisible, if no material deviations occur. In this latter case the control would only become visible if it is desired that the control act as a deterrent.

To summarize, it is not the existence but rather the exercise of control that leads to either an aggressive organizational atmosphere, for employees at one extreme, or an anarchistic one at the other. It is mostly management style that determines the nature and extent of the exercise of control. Given this, any objections that are raised regarding the existence of controls are largely misdirected, unless they have to do with onerous automatic controls. Generally, when control is aggressive it is a case of overzealous application.

As discussed above, how control is viewed is very much dependent on how it is applied. How control is applied depends, in turn, on the purpose for which it is used.

Aside from correcting unwanted deviations in performance, control when applied to employees has a number of derivative uses which have mostly to do with behaviour modification. This includes such purposes as informing, preventing/deterring, motivating, evaluating and training. Each of these will be elaborated in the following.

Informing

In the absence of general communication, or as an exception routine, the detection of a material deviation in actual from desired performance is often used as an appropriate occasion to inform the employee about preferred activities, appropriate processes or requirements. Although this is not considered a desirable substitute for properly informing employees of general, work-related requirements or events, prior to execution, it may be appropriate for those cases where those requirements or events are selectively applicable or for employees which, for some reason, did not receive the general communication (e.g. absent due to vacation or sick leave) or did not understand it when received. In this case the control function merges with the communicating function.

Preventing/Deterring

The purpose here is to prevent an event from occurring or to deter undesirable activity. In the case of preventing as a purpose, the control simply acts in the capacity of one of the two major classes of control, i.e. preemptive and corrective. The second purpose, deterrance, depends on close coordination with the communication function for effectiveness as the employee should be aware of the existence of the control and of the repercussions of undesirable behaviour, when detected.

Motivating

This purpose is very much related to the others in that all control actions tend to affect motivation. However, how the control activity is carried out will determine whether the effect on employee behaviour will be positive, negative or neutral.

In cases where the encouragement of positive behaviour is an important objective, care would have to be taken to present the case to the employee in terms of preferred future behaviour (e.g. ... a good start in the desired direction but needs some improvement in this or that area...) rather than in punitive terms (e.g. You were wrong; never do that again or else!).

Evaluating

Evaluation or appraisal of employees has implications for control and controlling at two levels. First, systemic controls, although aimed at evaluation of delivery systems, are useable to evaluate indirectly the employees that operate those systems. In order to be able to do this, the controls intended for such use will have to be at a detailed enough level for that to be feasible. Also, controlling action will have to take into account the dual role of the control.

Second, some of the controls will have to be specifically designed for personnel management purposes. Management by Objectives (MBO) is an example of this.

Training

To the degree that all employees learn from their mistakes, all controls and associated controlling activities contribute to the training purpose. When training is carried out for the specific purpose of controlling activity, however, the way in which it is exercised is important.

For example, in addition to presenting required actions to the employee in ways that will positively motivate future action, the content of the advice or instruction will need to include suggestions which will improve the ways in which future action will be carried out.

SECTION FOUR: THE DIMENSIONS OF MANAGEMENT CONTROL

Control of Operations

Any discussion of organizational control must necessarily begin with control of operations – the *raison d'être* of the organization. The manager's role with respect to operations controls is at two levels. In the first instance, the manager is responsible for the development of the infrastructure, the wherewithall to produce the product or service which is the main reason for the existence of the organization that the manager manages. Secondly, the manager operates the control system on an on-going basis.

As described in earlier sections, the infrastructure consists of static (e.g. the organization structure, associated delegation documents, job descriptions, etc.) and dynamic elements (the delivery process) and includes their respective controls. Figure 1 (see Section Two) displays an elementary delivery system (operating system) along with its associated control sub-system. In this case the control sub-system is a closed system; i.e. it neither receives input from nor sends output to the environment.

In this scenario, it is assumed that any deviation from desired performance that is detected can be corrected automatically, or at least without recourse to outside help. This is typical of both mechanical/electronic automatic controls and of controls which are operated by non-managerial staff, based on pre-determined rules. These are the simplest form of control.

The next scenario, portrayed in Figure 2 (see Section Two), takes account of those cases where the detected deviations from desired performance are such that no pre-determined rule exists for their automatic correction. This is necessarily an open control sub-system since there has to be intervention from outside the system (higher authority – the manager) in order to rectify the problem identified.

The intervention required will depend on the nature and extent of the deviation. The situation may require a new decision rule, new criteria or a redesign of the delivery system, or control system, or both.

In both the open and closed versions of control sub-system the control may be exercised over the input, the process or the output (Figures 1 and 2 display the control loop related to the output only). A more thorough discussion of the subject of control is provided in Chapter 2¹¹.

In summary, the manager's role with regard to operations is at two levels. First, at inception, the manager is responsible for the development of the infrastructure which will enable the host organization to produce the product or service it is mandated to produce, including the associated control sub-system(s). Second, during the operating period, the manager is required to monitor the infrastructure, primarily through the controls developed, and take remedial action when deviations of unanticipated extent or nature are detected. As indicated in the previous sections, these two roles may be referred to as the manager's organizing and operating roles respectively.

Management Controls

The foregoing dealt with control of simple operations, those which have only one process or activity. In this case operations level (i.e. delivery system) controls and managerial (i.e. results) controls, although distinct conceptually, can be physically identical (see Tables 6 & 7).

In what follows, conditions will be described that will require some distinctions to be made between operations and managerial controls.

The conditions that require distinctions between delivery system and results controls are of two types. The first has to do with complex operations and the second with the management role at levels higher than direct operations management.

11 Volume II, Part 2, Chapter 2, "Control Concepts and Applications for Internal Auditors".

Complex Processes or Activities

Complex activities can be of two kinds, those that simply number more than one, i.e. the manager has several to manage, and those that produce a product or service that is not simply the sum of the individual activities (see Figure 9).

In the case of the first kind, the results have to be aggregated or consolidated for reporting purposes. Although it is conceivable that they could be a simple tabulation of the results of each activity, generally, it would not be efficient for the manager to keep track of them individually and it would certainly not be acceptable to relay such a detailed tabulation to higher-level management.

The usual method used for aggregation or consolidation of results for purposes of efficient reporting (control) is to use performance indicators (i.e. indexes of performance which represent the detail). An example of this for economy controls is the reporting of budget totals (actual vs. budgeted), instead of details, to higher management.

The second kind is more complex than the first in that the composite results are not simply an aggregation of the results of individual activities.

An example of this, again for economy controls, is where the number of activities is sufficient to warrant a common support group, thus achieving economies of scale. Here one could contemplate simply aggregating individual activity results as before, however, since the activities are not homogeneous (e.g. a mixture of line and support) the control system would, at the minimum, at least report aggregate results (totals) for the two main types of activities separately.

Table 6

Typical Control Objectives

A) Delivery System Control Objectives

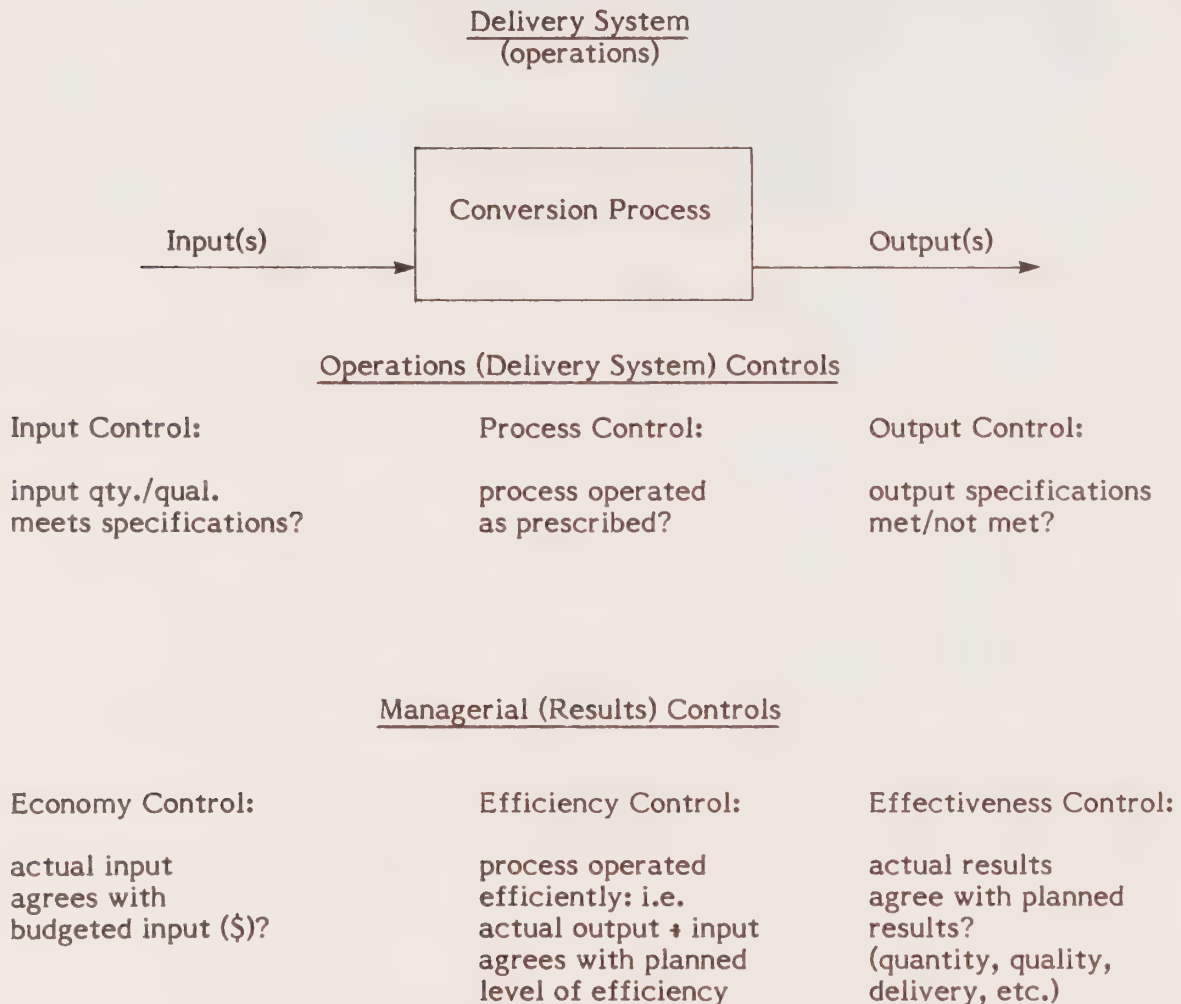
| Input Control Objectives | Conversion (Transformation Process) Control Objectives | Output Control Objectives |
|--|---|--|
| Controls to ensure: | Controls to ensure: | Controls to ensure: |
| <ul style="list-style-type: none"> - Selection and maintenance of suitable infrastructure, resources and raw materials - Appropriate handling of demands for service | <ul style="list-style-type: none"> - Prevention or detection of accidental errors in conversion of input to output - Prevention or detection of fraudulent activities during the conversion of input to output - Security of conversion process to ensure continuous operation - Compliance with authorities and prescribed policies and procedures | <ul style="list-style-type: none"> - Completeness of output - Accuracy or freedom from error in outputs - Timeliness and appropriate distribution of output - Compliance with specifications from higher authority |

B) Results Control Objectives

| Economy Control Objectives | Efficiency Control Objectives | Effectiveness Control Objectives |
|---|--|---|
| Controls to ensure that resource acquisition and maintenance is done economically | Controls to ensure that output achieved for input applied is optimal | Controls to ensure that the entity's output is according to plans and has the desired effects |

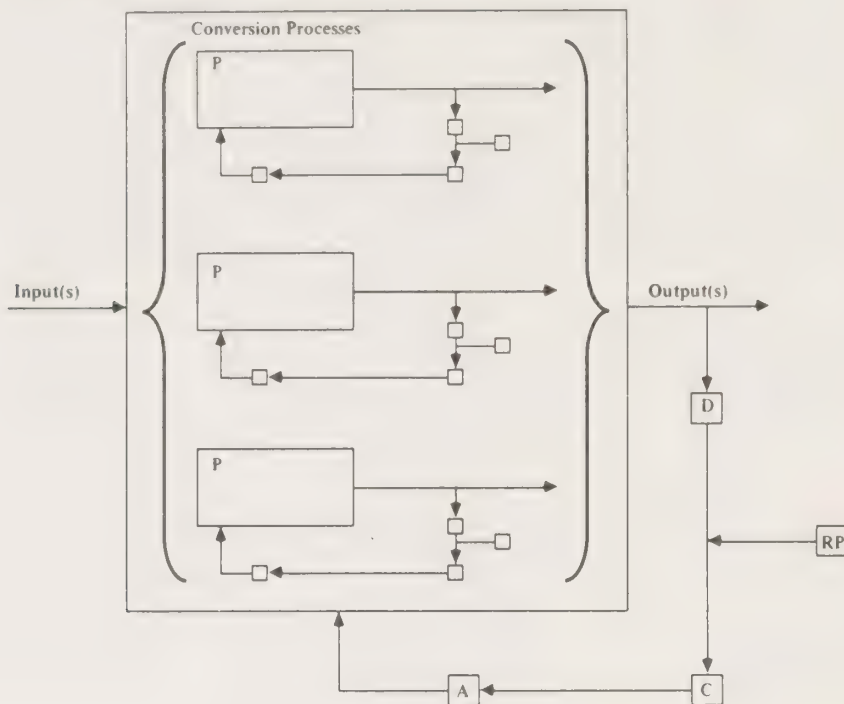
Table 7

Example of Combined Delivery System and Results Controls



COMPLEX PROCESSES OR ACTIVITIES

(a) Aggregation of results



(b) Integration of results

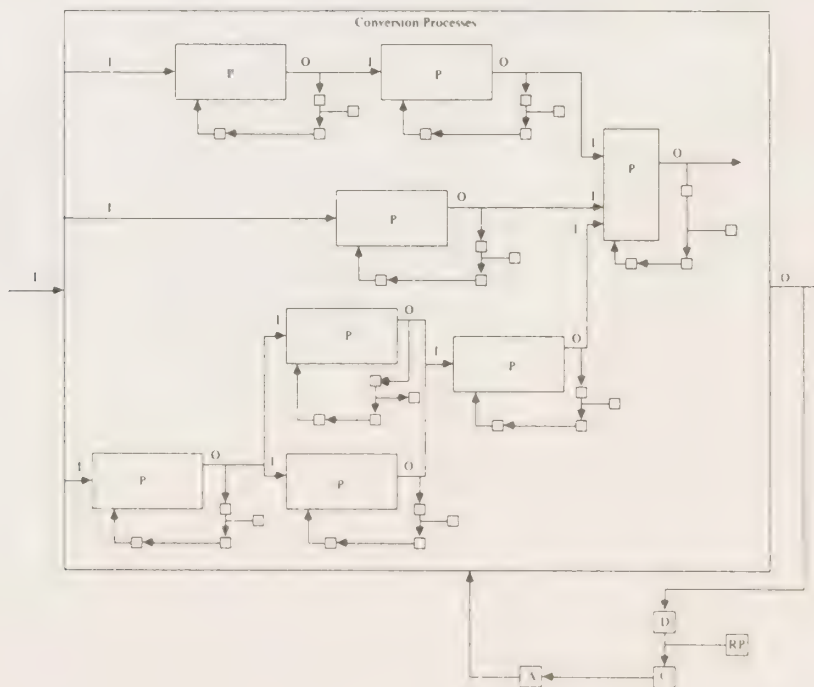


Figure 9

Another example, this time for effectiveness controls, could be where the finished product is an assembly of the outputs of a number of other activities. In this case, again, the activities are not homogeneous, i.e. the final output is not simply the sum of the individual activity outputs. Also, effectiveness is not simply a reflection of the physical output of the process(es) but rather of the effect the combination of its production and delivery has on the recipient in particular and the environment in general. This is particularly applicable to intermediate outputs. A specific example would be a training activity. Its direct output is a trained individual, however, its intended effect is to achieve better performance of that individual on the job. Effectiveness controls are meant to cover not only direct and intermediate outputs, but effects as well.

Higher-level Management

Controls systems for higher levels of management are inherently complex because the systems they control are complex. This is because the system being controlled includes all lower-level systems. For example, second-level managers manage their first-level manager(s), usually more than one, along with their respective operations. This implies the control of at least two types of processes, the operations, at least at the aggregate level, and the managerial process of the subordinate manager(s) (i.e. planning, organizing, etc.).

The hierarchical nature of the management process, including management controls is displayed in generic form in Figure 4 (see Section Two) and an elaboration which includes the components of the management process in Figure 10.

If the components of the management process are treated like any other process, conceptually, then all discussion thus far concerning delivery system controls applies. The managerial processes have inputs, conversion processes and outputs, like any other process, and may have controls for these three elements accordingly. The decision to implement formal controls would be made on the same basis as any other control decision, i.e. based on materiality, risk and cost criteria. As usual, the cost of the control must be justified by the risk avoided. This does not preclude ad hoc, informal control being exercised.

MANAGEMENT PROCESS CONTROL MODEL

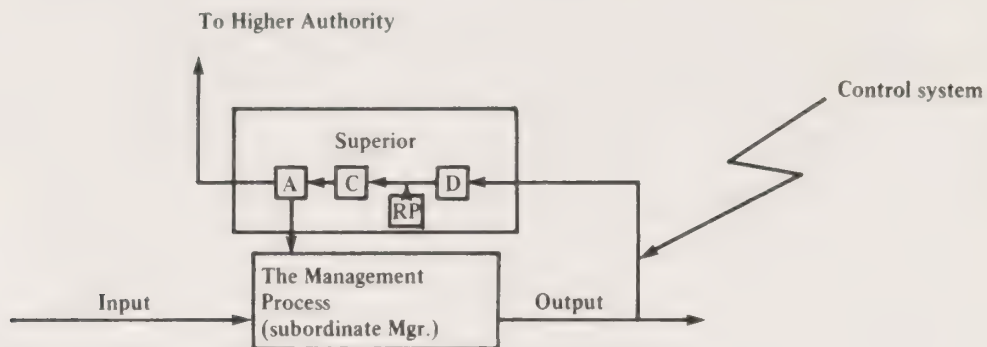


Figure 10(a)

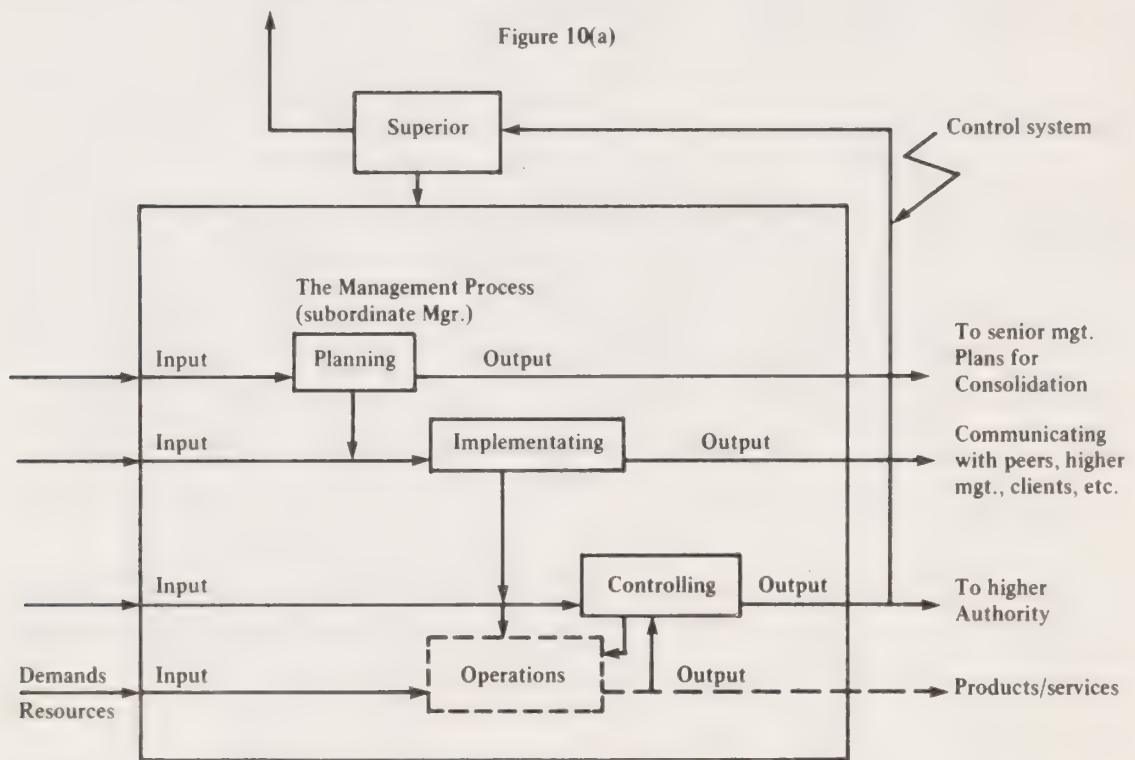


Figure 10(b)

Legend
D = Detector
RP = Reference Point
C = Comparator
A = Activator

Figure 10

Since the operations of all higher-level management include at least two types of activity (i.e. product/service delivery systems and their management) they are necessarily classed as complex. Therefore, the discussion in the preceding part, regarding the distinction between operations and managerial controls is generally applicable here. The main difference, due to the typically hierarchical nature of the managerial structure, is that managerial controls will tend to be progressively more aggregative for progressively higher levels of management.

Where management has adopted the Management By Objectives (MBO) system of performance measurement (control) for individual managers there may exist two parallel control systems, one for the organizational unit (e.g. responsibility centre) and one for the manager (the MBO system). It is, of course, possible to merge the two, however, it must be remembered that the criteria/indicators for individual and unit performance are not necessarily identical. This may dictate independent controls.

SECTION FIVE: MANAGEMENT AUDITING

Results vs. Infrastructure (Structure and Process) Auditing

The results vs. compliance auditing issue has many facets. Some of the controversy surrounding this dichotomy is as much due to misunderstanding of the terminology as to real differences.

First, let us deal with the compliance issue. The usual use of the term compliance audit has its roots in private sector, external auditing (financial attest auditing), where it is used in relation to testing of internal controls in order to make judgments about the extent of substantive testing required. In this case, the compliance testing activity plays a role which is secondary to the main role of financial attest auditing.

A second root is the public sector external audit role of determining compliance with authorities. Again this compliance testing role is largely subsidiary to the usually more significant roles of financial attest and, more recently, economy, efficiency and effectiveness audits.

In both the above cases the roles of substantive testing and compliance testing occupy primary and secondary roles respectively.

In internal auditing the roles of compliance and substantive testing are reversed. Internal audit's main *raison d'être* is to reflect to management the degree to which results/performance planned or prescribed are in fact being achieved (i.e. the degree to which actual performance complies with required performance). This is done by reviewing and assessing internal controls. In this case the substantive testing process is similar in content but different in role. Its role is a supporting one to the compliance one, aimed at substantiating assertions about actual vs. required performance of delivery systems (structures and processes) and their respective results; and, at identifying causes of non-compliance and consequent effects or impact on the managers operations and environment.

As may be seen from the above, internal auditing, although technically compliance auditing (in external audit terms), has as its target all aspects of compliance, including: compliance of the existence and operations of infrastructure (structures and delivery processes) with requirements (e.g. legislation, policies, regulations, guidelines, systems specifications, procedures, etc.); and, compliance of results/output with plans or requirements (e.g. output specifications, performance indicators, and economy, efficiency and effectiveness objectives, i.e. the 3Es).

This allows the auditor to provide management with opinions on whether desired results are being achieved and on whether those results are likely to continue to be achieved.

In summary, although what internal audit does is compliance testing, technically (in external audit terms) the assertions that it reviews and assesses are in terms of both "infrastructure" and "results".

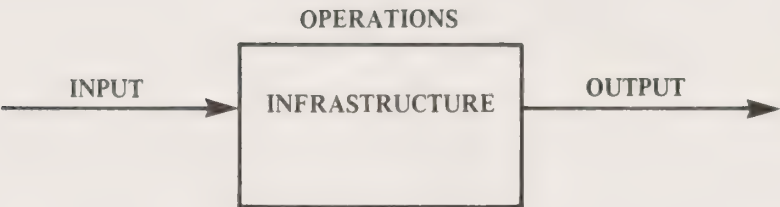
Auditing Operations

As may be seen from the discussion in Section Four, in the case of simple operations, infrastructure (structures, processes) controls and results (management) controls might be physically merged. In this case there may be as few as three physical controls but supporting as many as six assertions, representing six control objectives (see Figure 11).

The presence of formal, physical controls and the formal statements of corresponding assertions about the state of the respective organizational elements are determined by the risks involved.

In auditing management controls, and providing opinions on the associated assertions about the state of the operations, the above described possibility has to be taken into account. In other words, unless the respective risks are not sufficient to warrant it, the auditor is expected to verify assertions about all six basic control elements (i.e. input, conversion, output; the 3Es) even though there may be less than six controls to examine.

THE RELATIONSHIP BETWEEN CONTROLS AND ASSERTIONS
(Simple operations)



| | | | |
|------------|------------------|------------------------------|-------------------------|
| CONTROLS | INPUT | INFRASTRUCTURE | OUTPUT |
| ASSERTIONS | INPUT ECONOMY | INFRASTRUCTURE EFFICIENCY | OUTPUT EFFECTIVENESS |

Figure 11

In the case of more complex operations, there will generally be at least six controls (again, given that the risks involved warrant them); however, there may be many more, depending on how many activities/processes are included in the operations (see Figure 12 for two possible configurations; Cases A and B). In addition to at least one control for each of the results/management assertions (the 3Es) there will be input, conversion and output controls for each major process or activity.

Auditing the Management Infrastructure

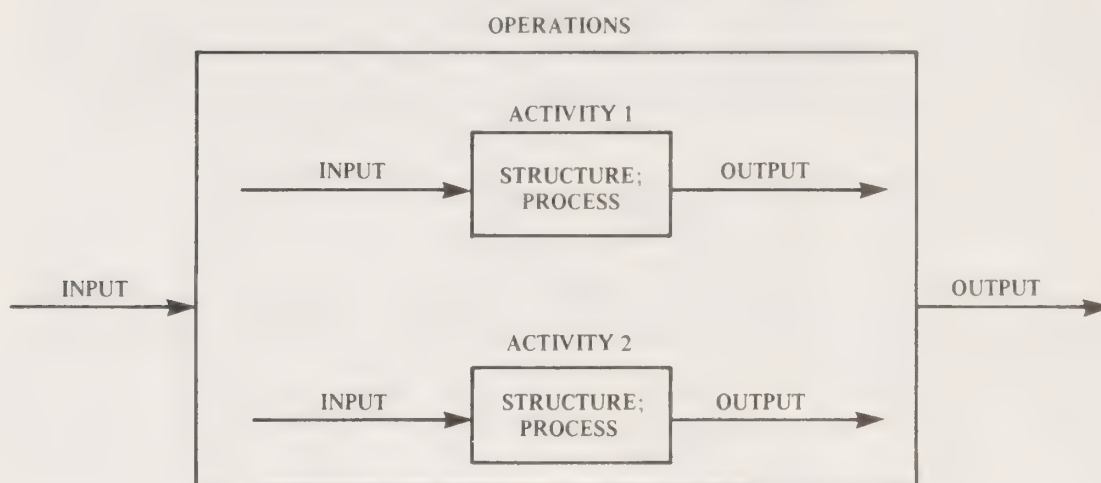
In conceptual terms, the components of the management process may be treated in the same way as any other operation; i.e. each management activity or component may be broken down into the elements: input, conversion and output. As well, any decision to develop formal controls should be based on risk criteria as would be the case for any other control decision.

As with all operations, management activities or components may be broken down into sub-components for purposes of more specific management attention (e.g. the planning component might be broken down into strategic long-term operational and current-year operational planning and resource planning). If this results in associated system and sub-system controls, they would of course be included in the auditor's pre-determined control framework for examination and assessment accordingly.

Since management is generally associated with operations being managed, a pre-determined control framework for any level of organization above the first level (i.e. lowest level responsibility centre) would automatically qualify as a complex operation. The minimum set of operations in this case would consist of a delivery system being managed and its associated managed structures or processes (see Figure 13). Here one would expect to find at least nine controls in the predetermined control framework), six for delivery systems and three for results (Figure 12), although there may be more. The reason for a minimum of six controls for delivery systems is that the delivery systems for management operations and production operations are sufficiently different that they cannot be combined, as were the activity 1 and 2 controls in Case A, Figure 12.

THE RELATIONSHIP BETWEEN CONTROLS AND ASSERTIONS

(Complex operations; more than one activity)



CASE A

| CONTROLS | COMBINED OPERATIONS | | |
|------------|---------------------|----------------------------------|-------------------------|
| | INPUT | STRUCTURE; PROCESS | OUTPUT |
| ASSERTIONS | INPUT ECONOMY | STRUCTURE; PROCESS EFFICIENCY | OUTPUT EFFECTIVENESS |

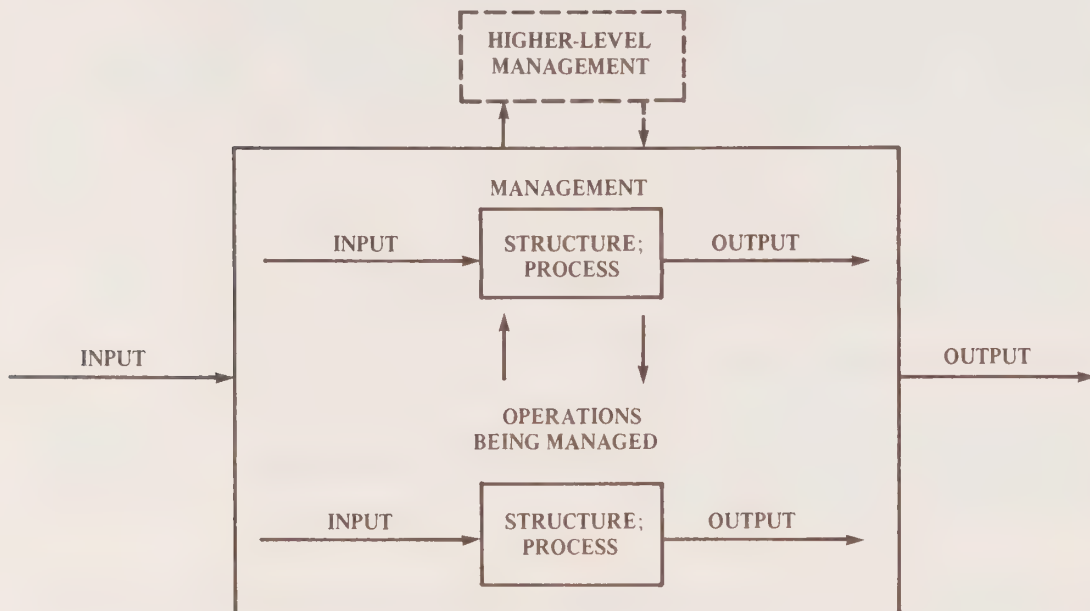
CASE B

| CONTROLS | ACTIVITY 1 | | | ACTIVITY 2 | | |
|------------|------------------|-----------------------------------|------------------------------|------------------|-----------------------------------|------------------------------|
| | INPUT | STRUCTURE; PROCESS | OUTPUT | INPUT | STRUCTURE; PROCESS | OUTPUT |
| ASSERTIONS | INPUT ECONOMY | INFRA- STRUCTURE EFFICIENCY | OUTPUT EFFECTIVE- NESS | INPUT ECONOMY | INFRA- STRUCTURE EFFICIENCY | OUTPUT EFFECTIVE- NESS |

Figure 12

THE RELATIONSHIP BETWEEN CONTROLS AND ASSERTIONS

(Complex operations; operations and their management)



| CONTROLS | MANAGEMENT | | | OPERATIONS BEING MANAGED | | |
|------------|------------|-----------------------|--------------------|--------------------------|-----------------------|--------------------|
| | INPUT | STRUCTURE; PROCESS | OUTPUT | INPUT | STRUCTURE; PROCESS | OUTPUT |
| ASSERTIONS | INPUT | STRUCTURE; PROCESS | OUTPUT | INPUT | STRUCTURE; PROCESS | OUTPUT |
| | ECONOMY | EFFICIENCY | EFFECTIVE- NESS | ECONOMY | EFFICIENCY | EFFECTIVE- NESS |

Figure 13

In summary, from the point of view of the development of a pre-determined control model, the process of auditing an operation (whether simple or complex), along with its associated management structures and processes, would be treated as a complex operation overall. However, unlike the case of two homogeneous operations, in this case a minimum of six rather than three delivery system controls are required due to the substantial differences between management structures/processes and the structures and processes which comprise the operations being managed.

Auditing Results (Economy, Efficiency and Effectiveness)

The Relationship between Economy, Efficiency, Effectiveness and Results

The Standards¹² define "economy", "efficiency" and "effectiveness" as independent and mutually exclusive terms as follows:

Economy: "Economy refers to the terms and conditions under which the government acquires human and material resources. An economical operation acquires those resources in appropriate quality and quantity at the lowest cost."

Efficiency: "Efficiency refers to the relationship between goods or services produced and resources used to produce them. An efficient operation produces the maximum output of a specified quality or characteristic for any given set of resource inputs or it has minimum inputs for any given quantity and quality of service provided."

Operational Effectiveness: "The extent to which operations achieve their objectives or goals."

Program Effectiveness: "Program effectiveness concerns the extent to which a program achieves its goals or other intended effects."

12 Treasury Board of Canada, Standards for Internal Audit in the Government of Canada.

As may be seen from the foregoing definitions, although the terms are distinct, they are not independent. The definition for economy overlaps with that of efficiency in that part of the efficiency equation (i.e. ratio of output achieved to input/resources used) absorbs resources used, the main concern of economy. In fact the term efficiency, taken in its global sense (i.e. all resources used in an operation) could be, and often is, interpreted as including economy.

Similarly, efficiency is related to effectiveness in that efficiency relates output to input either by minimizing input while keeping output constant or increasing output for a constant input or a combination of the two. In all cases, output (the prime concern of effectiveness) plays an important role.

Finally, if effectiveness is interpreted globally (i.e. all objectives and goals achieved) it could readily be seen as encompassing economy and efficiency as they are managerial goals or objectives as well.

As will be seen later, regardless of their non-independence, the three terms are useful to both managers and auditors for a variety of reasons.

The term "results", if interpreted from the point of view of the manager, at whatever level, is a very broad term. To the chief executive officer/deputy head it could mean aggregate economy, efficiency and effectiveness in terms of: organizational/program outputs and effects, achievement of organizational policies (whether output or infrastructural); achievement of organizational profitability or economy/efficiency targets, achievement of quality standards, achievement of good labour relations, etc. To the manager of a delivery system (whether program delivery or support) it may mean economic, efficient and effective operation of that system; to an activity manager it may mean delivery of intermediate output of a specified quality, at specified times, to specific users.

In general, the manager has two broad, results oriented concerns: meeting output goals/objectives (quantity, quality, timing, distribution) and maintaining the ability to continue to meet these goals/objectives (i.e. the delivery system) within the framework of organizational (e.g. head office) and environmental (legal, regulatory, etc.) requirements or constraints.

Auditing Economy

As indicated in the definition, economy has to do with acquisition of resources of appropriate quality and quantity at the lowest cost. In global terms this could be interpreted as the acquisition, and maintenance in readiness, the ability or capacity to produce the product or service which is the *raison d'être* of the organization or organization unit concerned.

Given that interpretation, it would then include both raw resources (labour, materials) and delivery systems (structures, processes/systems and procedures). This would roughly parallel the "organizing" role of management.

The most recognizable example of an economy control is a budget vs. actual report, which compares input planned vs. input used, in dollar terms, (in the production of a given quantity and quality of output). Although the budget report is a well-known control mechanism, it is seldom associated with the conditional phrase shown in brackets above, at least not explicitly. Yet it is only in that context that it is truly meaningful.

An exception to that rule would be the case of discretionary spending, where the manager is being committed to maintaining a certain level of capability rather than producing a predefined quantity of goods or services. However, even in this case some relationship between input and output might be established, perhaps on a statistical basis, if the output has some homogeneity. For example, although in handling a legal case the time or effort to complete any one case may be unpredictable, if the legal adviser handles only cases of a certain type, which have a limited range of complexity it may be possible to establish the average number of cases one lawyer can handle per year, within a predictable precision range, e.g. 150 cases ± 5 .

This number can be used for purposes of determining the number of lawyers required to handle a legal practice consisting of a predicted number of cases per year. In the case of development of a system the economy control could be in project management terms, such as time estimated vs. time taken and/or dollars of expenditure estimated vs. used. Again the implicit assumption is that there is an implied...

"for the amount of work accomplished" condition attached, in terms of milestones achieved or output produced.

In auditing economy, the auditor expects to find economy performance indicators for all major units of resources acquired or maintained, related to given units of outputs produced or capability maintained. Mathematically this could be expressed as:

$$E_1 = \frac{C_a}{C_p}$$

Where:

E_1 = Economy Indicator*

C_a = Cost of Input actually used*

C_p = Cost of Input planned*

* These variables may be summations of a number of resources, the only limitation being that they have to be in the same units (e.g. \$s)

Where resources cannot be readily correlated to output produced, before the fact, the economy indicator has two possible uses:

- As an indicator of expenditure management control (i.e. dollars spent vs. dollars planned);
- As an indicator of forecasting ability (actual units processed, necessitating actual dollars spent vs. estimated units of demand, requiring planned dollars of expenditure). Where resources can be related to output, efficiency is a better measure of performance than economy. In fact, in this case, economy performance is absorbed by the efficiency performance measure.

Auditing Efficiency

Efficiency is a term that is used in a number of ways. For example, it is often used interchangeably with the term productivity, a general term connoting abundance - not necessarily for the least possible input, but used somewhat differently in business circles. At the other end of the scale, it is used in a much more specific manner by industrial engineers to indicate the degree to which the ratio of actual output over input meets a standard output over input ratio.

The more usual use of the term is simply:

$$E_2 = \frac{O}{I} \quad \text{where } \begin{array}{l} E_2 = \text{Efficiency} \\ I = \text{Input} \\ O = \text{Output} \end{array}$$

This is also what is usually meant by productivity.

In this chapter, the two terms will be used interchangeably, in order to conform to general usage, however, two gradations of the use of the ratio will be presented: one representing the case where actual efficiency is compared to planned, which is based on history; and the second, based on an engineered index of efficiency, where actual efficiency is compared to an engineered standard.

(a) Case 1: Actual efficiency compared to planned efficiency

In this case planned efficiency may be arrived at in a number of ways. The most usual approach is to base it on historical data. Other possible ways are, comparison with other similar activities in the same organization, other organizations, other sectors (public with private and vice versa), industry-wide data, etc.

Ways in which such efficiency/productivity ratios might be expressed are:

$$(i) \quad E_2 = \frac{E_a}{E_p}; \text{ where } E_a = \frac{O}{I} \text{ (actual) and } E_p = \frac{O}{I} \text{ (planned)}$$

$$(ii) \quad E_2 = \frac{I_a}{I_p} \quad (\text{for constant output})$$

$$(iii) \quad E_2 = \frac{O_a}{O_p} \quad (\text{for constant input}),$$

$$\text{(i.e. } \frac{O_a}{I_c} \div \frac{O_p}{I_c} = \frac{O_a}{I_c} \times \frac{I_c}{O_p} = \frac{O_a}{O_p} \text{)}$$

$$(iv) \quad E_2 = \frac{T_a}{T_p} \quad (\text{for constant output/input})$$

Where: E_2 = Efficiency index

E_a = Actual efficiency achieved

E_p = Planned efficiency

I = Input

I_c = Input held constant

O = Output

T_a = Actual time taken (hrs., wks, mos. yrs.)

T_p = Time planned

Note: As with the economy indicator, efficiency indicators and their components may be summations or aggregates provided that they are expressed in the same units.

(b) Case 2: Actual efficiency index achieved compared to a standard index

In this case the actual ratio or index of output over input achieved is compared to a standard efficiency ratio, which was arrived at through an engineered study such as time and motion study or work sampling.

It follows, from the foregoing discussion, that efficiency controls depend on knowing both the input and output components of the index. However, it is possible to use the efficiency indicator as a control where the output cannot be precisely defined if there is some assurance that the output has remained approximately constant over the period concerned.

This type of indicator is generally less precise; its precision being dependant on the degree to which output has indeed remained constant. In any case, this type of efficiency indicator is less reliable than those for which all components are precisely defined.

Efficiency performance indicators may be employed by managers at all levels from individual indicators at the project/activity level, to aggregate indicators at the global level (e.g. program or organization-wide), depending on how significant management considers those projects, activities, etc. to be.

In auditing for efficiency, the auditor expects to find efficiency controls for all major or significant activities (whether projects or on-going activities), as part of the control framework. Where such controls are not in evidence it will be necessary for the auditor to demonstrate the feasibility of establishing such a performance measure and the benefits to be derived from doing so, before recommending that such a control be installed.

Auditing Effectiveness

Auditing effectiveness has a number of dimensions, depending on level of focus and the definition used. At the minimum, a distinction is made between output effectiveness and program effectiveness. In the federal government, output effectiveness is the domain of internal audit while program effectiveness is assessed by the program evaluation function.

This does not mean, however, that internal audit has no part to play in program effectiveness control. Internal auditors would expect to find program effectiveness performance indicators as part of the organizational control framework. The difference in treatment occurs in the substantive/detailed testing phase of the audit. Where output effectiveness indicators are missing or ineffective, the auditor would be expected to detect and substantiate this, and to demonstrate the feasibility and cost-effectiveness of installing appropriate controls. In the case of program effectiveness controls, the auditor would be expected to detect their lack or ineffectiveness but would defer to program evaluators to substantiate the ineffectiveness and to demonstrate the feasibility and cost effectiveness of appropriate controls.

Output effectiveness can of course be measured at all levels of activity, starting with projects and progressing through various intermediate product or service levels to final product or service, i.e. the product or service that is delivered to some client outside the organization under audit.

The general expression of the effectiveness indicator is in terms of a ratio of output achieved to output planned, or to a standard (e.g. a specification).

In mathematical terms, this may be expressed as:

$$E_3 = \frac{O_a}{O_p}$$

Where E_3 = Effectiveness Index
 O_a = Actual Output
 O_p = Planned or Standard Output

As with economy and efficiency indicators of performance, the effectiveness indicator may be a summation or aggregation of a number of either homogeneous outputs or homogeneous indicators or it may simply be an array or list of a number of indicators which are not readily combined (i.e. non-homogeneous).

CONCLUSION

This chapter has described and demonstrated the importance of control as a management mechanism in terms of its structure (the control system or framework) and its process (the operation of the control system). Control was also discussed in terms of its value to the auditor as a proxy measure for actual organizational performance and as a method for achieving an efficient audit process.

In order to clarify the distinction between controls and the systems they control, a set of definitions were developed which are expected to be equally useful to managers, systems designers and auditors.

Since management's role is crucial to the existence and operation of control, in a number of ways, this relationship was discussed in some depth. This discussion supplemented by a discussion of the dimensions of controls and control activity then set the stage for a discussion of management auditing.

The discussion of management auditing is capped by a discussion of auditing economy, efficiency and effectiveness, an area of activity which is responsible for considerable confusion in the literature.

The treatment of management control in this chapter is not viewed as definitive in any sense, but it is hoped that it serves to clarify some of the relevant issues and clear up some misconceptions for managers systems designers and auditors alike.

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CHAPTER FOUR

ANALYSIS CONCEPTS AND PRACTICES FOR INTERNAL AUDITING

INTRODUCTION

In its early stages, the main activity of internal auditing consisted of "the verification of the authenticity and validity of charges", and dealt primarily with accounting and financial controls. One of the prime concerns of the auditor was the detection and prevention of fraud.¹

Currently, more emphasis is placed on a constructive approach to internal auditing, with at least as much interest shown in reviewing and evaluating the effectiveness of internal controls, so as to eliminate waste and inefficiency and improve productivity, as in those controls maintained for financial accountability and the detection and prevention of fraud.

For example, the scope of the Internal Audit Standards² requires the auditor to review the following areas:

The scope of internal audit shall encompass all aspects of a department's operations. The internal auditor assesses and expresses an opinion upon:

- the design, development, implementation, and operation of all systems, procedures, processes and controls, including computer-based systems;
- the reliability and adequacy of information available for decision-making and for accountability;
- the extent to which available information is utilized in the decision-making process;

1 See Standards for Internal Audit in the Government of Canada, Treasury Board of Canada, Comptroller General, 1982.

2 Ibid, p. 24.

- the adequacy of protection afforded public funds and assets; and
- the extent of compliance with legislative, central agency and departmental directions.

This modern concept of internal auditing has seen a shift in emphasis of audit coverage and substance from "dealing primarily with accounting and financial matters" to "any area of the entire organization where protective and constructive service to management can be provided".³

Figure 1 illustrates this changing emphasis and responsibility of internal auditors. This changing emphasis brings with it a need for a corresponding expansion of audit concepts and techniques in order to maintain audit rigour in these new areas of audit activity.

The overall purpose of this chapter of the Handbook is to provide an overview of the theory and conceptual context of a variety of analysis techniques currently used in adjacent disciplines but equally applicable to internal auditing. The thrust of the coverage provided in this chapter is to go beyond current conventional audit literature and practice (e.g. Internal Control Questionnaires; flow charting; statistical sampling), borrowing those analysis methods and techniques from adjacent disciplines (such as management science, operations research, economics, industrial engineering, etc.) which have the potential for improving the rigour and depth of the internal audit process. Since the subject matter presented here is already well covered in the literature (see the copious references in the Appendices) it is not discussed in detail; rather, the intent is simply to increase the auditor's awareness.

The methods and techniques described in this chapter fall into two broad categories: those which are immediately applicable by the average auditor without help and those which will require the help of a specialist and which may need further development in order to adapt them to the internal audit environment.

3 Ibid, p. 2.

Section One of this chapter will describe analysis concepts currently employed in other disciplines that are applicable to the field of internal auditing.

Section Two will further describe the application of these analysis practices with specific reference to the main activities inherent in the internal audit process. A detailed list of references, which highlights pertinent source material for the selected techniques and relates them to the audit process, is presented in the appendices (see Table of Contents).

CHANGING EMPHASIS AND RESPONSIBILITY OF INTERNAL AUDITORS

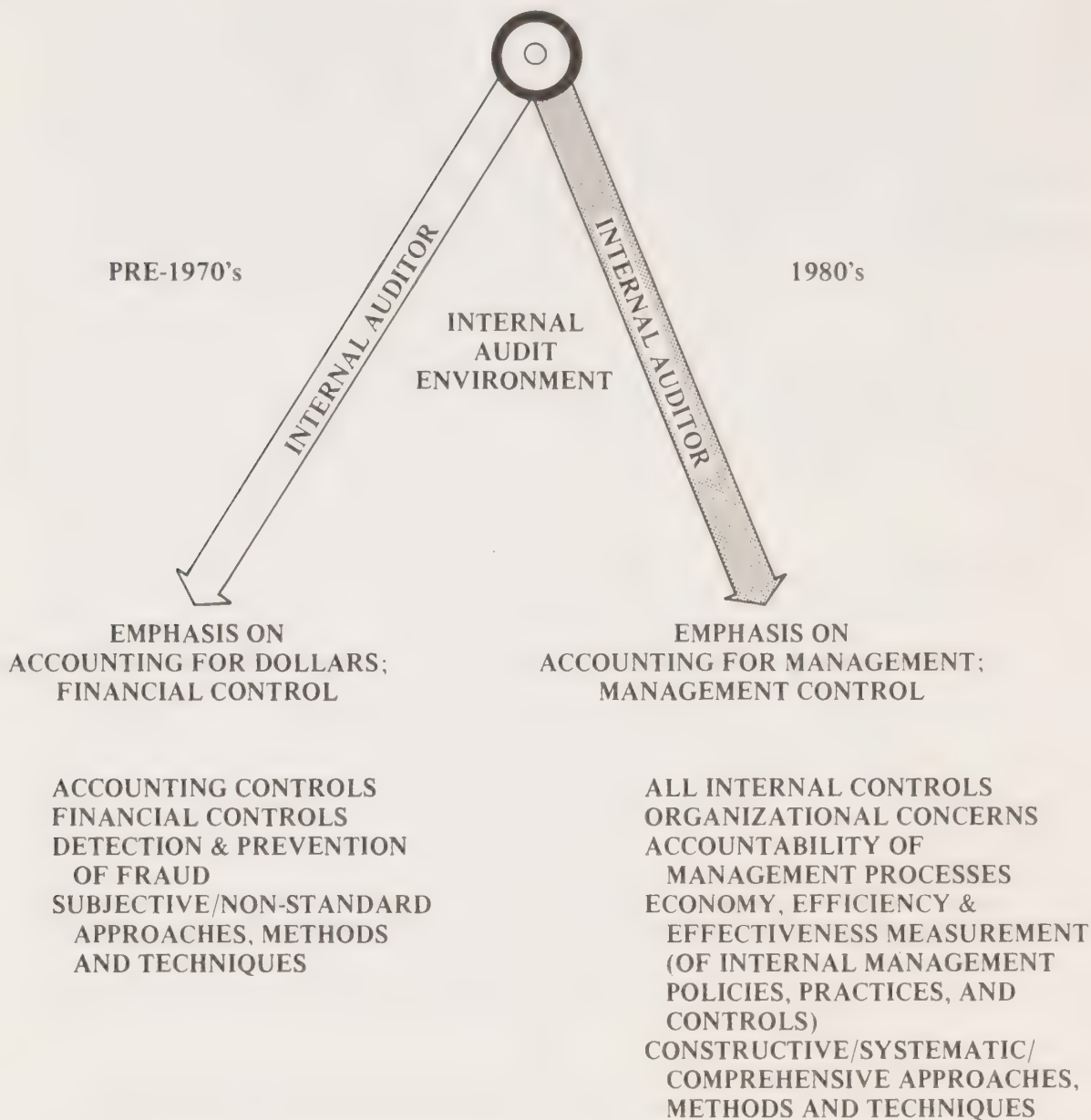


Figure 1

SECTION ONE: ANALYSIS CONCEPTS

Analysis Concepts in the Context of the Internal Audit Process

While agreement exists among auditors as to the importance of control, an explanation of what it is and how it is to be audited is generally not available in the literature written for public sector internal auditors. Nor is it dealt with in any other audit literature (private or public sector; external or internal audit) except for coverage of the subject of internal control, the scope of which is generally restricted to financial controls.

Volume II, Part 2, Chapter 2 of this Handbook, "Control: Concepts and Applications for Internal Auditors" provides an initial reconciliation of control theory with broad-scope auditing. Chapter 2, together with Chapter 3, "Management Control: Concepts and Practices", describes how the objectives and scope of the audit function can be met through the review and evaluation of the organization's control framework.

An organization's control systems can be represented by various models or frameworks. One useful model, designated the Descriptive Organizational Model (DOM), is a framework for systematically organizing the vast amount of detailed auditee information that has been collected. This model enables the auditor to describe the audit entity without concern, at that point in time, for judging the adequacy of the processes being reviewed, and to focus on "what is going on".

A second useful model, designated the Normative or Predetermined Control Model (PCM), is a prescriptive organizational model that provides the auditor with a comparative basis for determining the adequacy of the auditee's control framework. Two levels of control are addressed by this PCM framework. The first identifies the general management controls in place to ensure due regard for economy, efficiency and effectiveness; the second identifies the generally applicable process controls in place for regulating the day-to-day operations of the audit entity. This model focuses primarily on what controls should be in place (i.e. control objectives). It also contains the standards or criteria through which the actual auditee operations are to be evaluated.

The organizational control model serves as a vital tool in the structuring and communication of an auditor's approach to an examination. For example, this model will be of value in developing control questionnaires or checklists for use in the subsequent phases of the audit. Figure 2 illustrates the context of such models in the audit process, which is characterized by the major phases: assignment planning, review, evaluation, verification and reporting. For example, the review phase explicitly represents the structure and operation of the entity under review with a Descriptive Organizational Model, and explicitly represents the controls that should be operating with a Predetermined Control Model (see sub-components II.1 and II.4 respectively in Figure 2).

The process of auditing controls is increasingly being applied by the internal auditor to managerial and organizational concerns (as illustrated by Figure 1).⁴ This transition from financial control to more broadly based managerial control is depicted in Figure 3 from the perspective of controls.

Given this change in emphasis and scope, auditors must develop an understanding of a broader range of control strategies, frameworks and corresponding analysis methods if they are to properly assess operations controls and controls for economy, efficiency and effectiveness. Different auditee operating systems will require different controls. In turn, these requirements will present the auditor with a range of issues or problems in attempting to model the entity (e.g. boundary/closure problems; levels of systems/variable depth; adaptive/corrective systems; biased and/or simplistic judgments).

In order to address these concerns, structured analysis frameworks from a number of adjacent disciplines may be used to provide an appropriate balance between auditor and auditee judgment and structured evaluation. The following section will expand on the use of analysis concepts (and techniques) in auditing.

4 Ibid, Page 1.

THE INTERNAL AUDIT PROCESS AND USE OF CONTROL MODELS

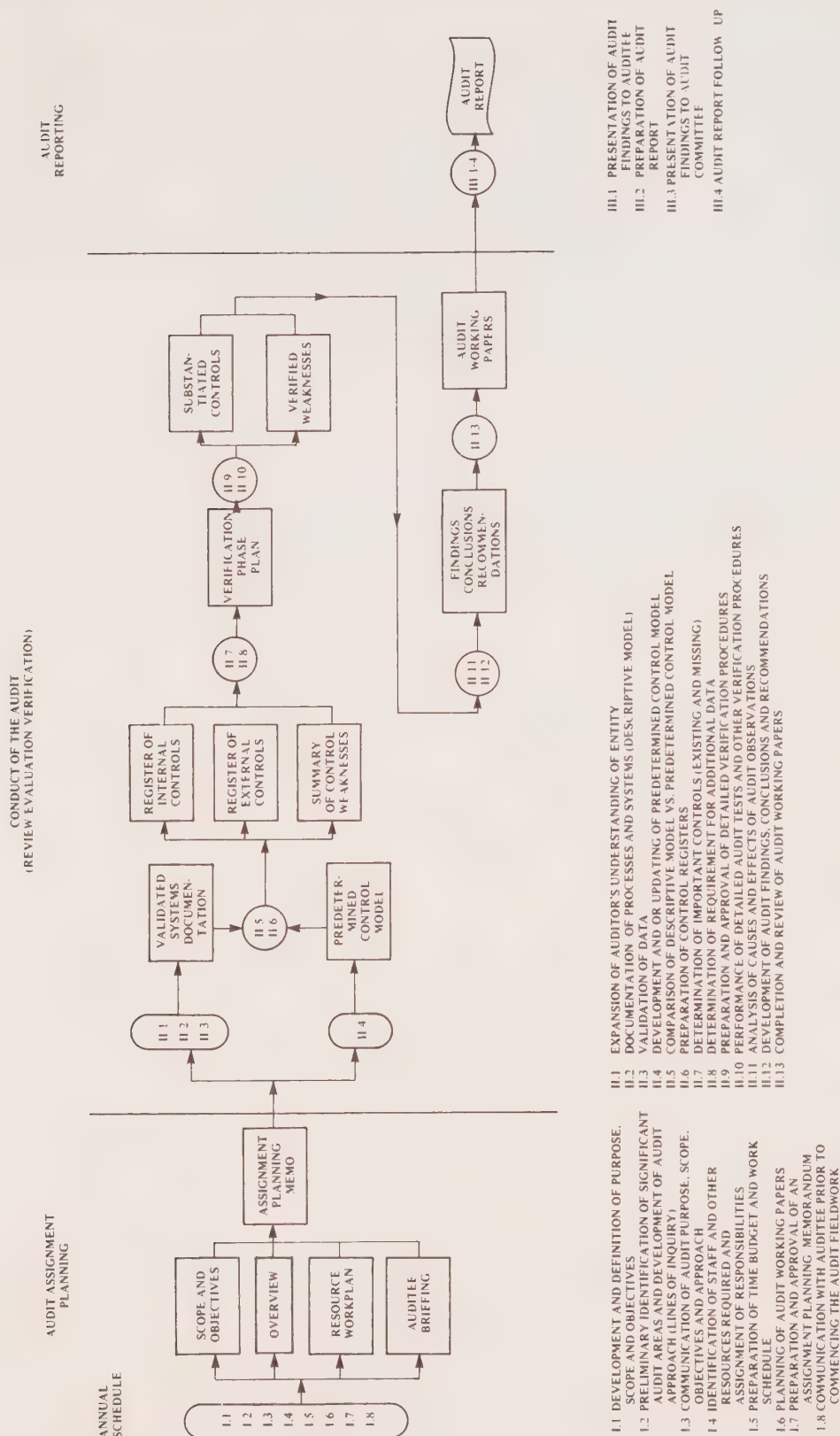


Figure 2

OVERVIEW OF THE CONTROL CONTEXT FOR THE AUDIT PROCESS

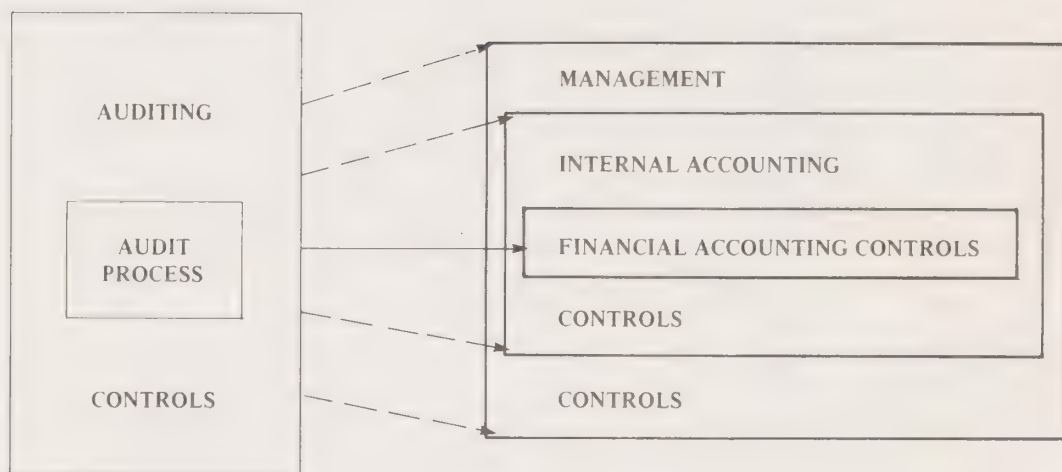


Figure 3

Elaboration of Analysis Concepts

Inherent in the use of organizational modelling, analysis methods and techniques for internal auditing is the need for more and better-grounded analysis and synthesis tools. Currently, the main techniques employed by the internal auditor are a carry-over from the financial audit perspective. These include document analysis, various interview techniques (e.g. Internal Control Questionnaires) and various verification techniques such as cross-checking, recalculation, reconciliation and non-statistical sampling. On occasion, more advanced techniques such as: macro-level organizational modelling (e.g. ASB's "Egg" model)⁵, flow charting, statistical sampling, and regression analysis have been used.

A number of other relevant models, methodologies and analysis techniques are available from adjacent disciplines (e.g. management science, operations research, survey sampling, industrial engineering, etc.) that could improve the arsenal of audit techniques, thus increasing the rigour and laterally the impact or worth of the internal audit function.

For example, in the recent book by White, M.J. (et al), Managing Public Systems: Analytic Techniques for Public Administration, a number of mainstream analytic techniques for building and assessing a management system are presented (see Table 1). Many of these techniques have direct application to the current role of internal auditing.

Table 2 illustrates how the general classes of analysis concepts and techniques interface with the audit process. Section Two will highlight a number of these analysis techniques and describe how they may be applied to internal auditing.

5 From: "A Structured Methodology for the Conduct of Comprehensive Auditing", Audit Services Bureau, Supply and Services Canada, 1982.

In using or adapting any of these more sophisticated analysis methods, the auditor will typically employ some form of systems theory, but in a control setting. For example, in a particular systems theory application to internal auditing, the emphasis of the investigation may be on questions, assertions or opinions as well as on answers.

The use of general systems theory facilitates the exploring and examining of various strategies to serve the same end (e.g. analysis techniques for the review stage, verification techniques) or ultimate outcome of the audit itself (e.g. opinion on controls, opinion on infrastructure or opinion on actual results).

Table 1

Analysis Techniques for Building and Assessing
a Management System⁶

| Modelling Concepts | Design and Decision-making | Evaluation |
|--|--|--|
| <ul style="list-style-type: none"> ● Environmental management models ● Flowcharting concepts and methods ● Network scheduling models (PERT, CPM) ● Forecasting models (Delphi, Spread-Sheet/S-curve) | <ul style="list-style-type: none"> ● Rational and incremental models of managerial decision-making ● Decision analysis models (Bayesian Analysis, Sensitivity Analysis, Decision Tree Analysis) ● Operations research methods (Goal Programming, Queuing, Replacement Planning, Simulation) | <ul style="list-style-type: none"> ● Forecasting for operational control (Smoothing Techniques, Disaggregation Techniques) ● Program evaluation methods (Performance, Strategy Analysis, Outcome Evaluation, Policy Analysis) ● Organizational accounting systems (Management Systems Models and Methods) |

6 Adapted from: White, M.J. et al, Managing Public Systems: Analytic Techniques for Public Administration, 1980.

Table 2
General Classes of Analysis Concepts and Techniques and their Interface with the Audit Process

| General Classes of Analysis Concepts and Techniques | | | | | | | |
|---|---|---|---|--|---|---|---|
| AUDIT PROCESS (MAJOR PHASE) | FLOWCHARTS NETWORKS DESCRIPTIVE MODELLING | DECISION THEORY | MS OR THEORY | GENERAL SYSTEMS THEORY | ECONOMIC FINANCIAL ANALYSIS | SAMPLING THEORY | EVALUATION CONTROL THEORY |
| ASSIGNMENT PLANNING | <ul style="list-style-type: none">Documents AnalysisDescriptive Organization Models (DOM)Process Models (Flowcharts, Decision Tables)Network Models (PERT, CPM)Predetermined Control Models (PCM) | <ul style="list-style-type: none">Issue/Problem Analysis ModelsMath Models | <ul style="list-style-type: none">Decision Tree AnalysisRational/Incremental Models of BehaviourRisk Analysis | <ul style="list-style-type: none">ASB "Egg" ModelOrganizational Analysis Models | | <ul style="list-style-type: none">Sample DesignSampling Strategy | <ul style="list-style-type: none">Strategic Planning ModelsEnvironmental Sensing ModelsSystems Logic ModelsBehavioural ModelsQuality Control Models |
| REVIEW * | | | | | | | |
| EVALUATION | <ul style="list-style-type: none">MatchingPrecedence Analysis | <ul style="list-style-type: none">Sensitivity AnalysisBayesian Models | <ul style="list-style-type: none">SimulationMarket-Research ModelsIndustrial Engineering (e.g., MTM) | <ul style="list-style-type: none">Goal Programming ModelsSystem Dynamics Models | <ul style="list-style-type: none">Marginal AnalysisRatio AnalysisInvestment ModelsCost Benefit AnalysisEconometric Models | <ul style="list-style-type: none">Sampling ImplementationSampling Analyses/Evaluation (includes Analytical Review/Risk Assessment) | <ul style="list-style-type: none">Information Processing ModelsCost Effective AnalysisCause Effect Analysis |
| VERIFICATION | | | | | | | |
| REPORTING | | | | | | | |

SECTION TWO: ANALYSIS PRACTICES

Cross-referencing the Internal Audit Process with Analysis Techniques

The audit process is displayed in its traditional form in Figure 2. The dynamics of this process is better demonstrated, however, in Figure 4, where the mainstream is assignment planning, evaluation and reporting in that order, with review and verification playing supporting roles to evaluation.

The assignment planning phase of the audit is a derivative of long-term and annual planning and a prerequisite to the conduct of the audit of a specific audit assignment. It starts with familiarization with the audit entity and culminates in a detailed audit planning memorandum. The plans may, of course, need to be refined at any stage of the audit, as shown in Figure 4.

The principal products of the assignment planning phase are:

- development and definition of audit purpose, scope, and objectives;
- preliminary identification of significant audit areas and development of audit approach (lines of inquiry);
- communication of audit purpose, scope, objectives, and approach;
- identification of staff and other resources required and assignment of responsibilities;
- preparation of time, budget and work schedule;
- planning of audit working papers;
- preparation and approval of an assignment planning memorandum; and
- briefing for auditee management.

DYNAMICS OF THE AUDIT PROCESS

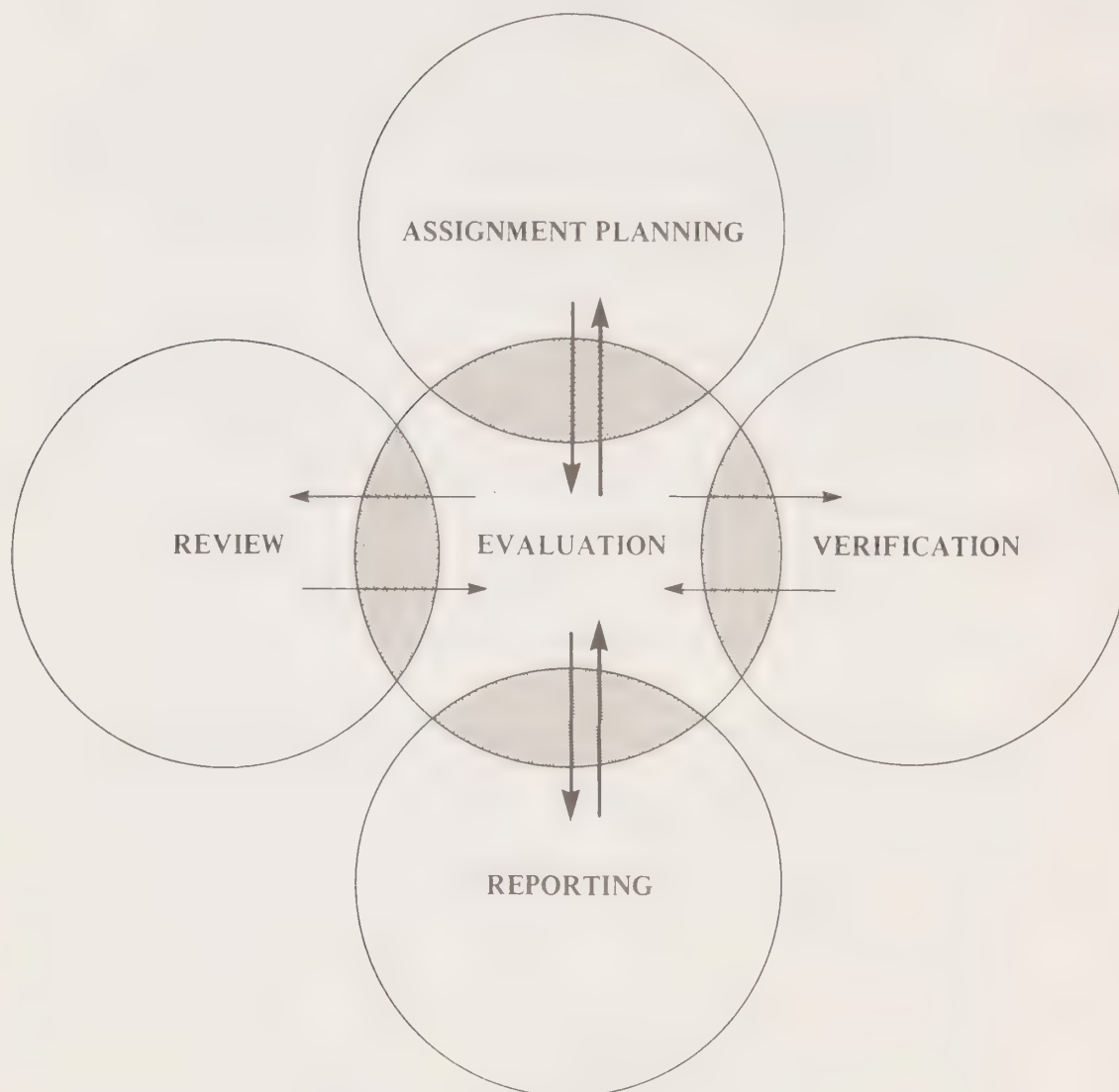


Figure 4

The review phase of the audit is devoted to the gathering of more detailed information concerning the entity's programs, objectives and activities, to developing a model of the current state of the entity under audit, to developing a normative (predetermined) control model, if not available from past activity, and to limited testing in order to identify potential problems or other matters warranting further detailed examination.

The principal products of the review phase are:

- detailed documentation of existing management control framework,
- predetermined control models, and
- potentially significant audit areas and issues.

The evaluation phase of the audit begins during the planning of the assignment and continues through to the drafting of the final audit report. The assessment of the management control framework (e.g. against a predetermined control model) is the core of the audit process. This iterative process includes data verification, cause and effect analyses, and development of audit findings, conclusions and recommendations.

The principal products of the evaluation phase are:

- register of essential controls,
- register of compensating and environmental controls,
- summary of weaknesses,
- plan for the verification work,
- analysis of causes and effects, and
- audit findings, conclusions and recommendations.

The verification phase of the audit is designed to collect sufficient additional, reliable evidence to support audit findings and conclusions. It is essentially an adjunct to the evaluation phase, focused on substantiating and consolidating preliminary findings and on providing evidence for the analysis of causes and effects.

The principal products of the verification phase are:

- substantiation of essential controls,
- verification of significant control deficiencies, inefficiencies and weaknesses,
- substantiation of causes and effects, and
- completed audit working papers.

The reporting phase of the audit is the mechanism by which the auditor communicates findings to management to assist them in monitoring the economy, efficiency and effectiveness of internal management practices and controls, in improving the control framework and in ensuring adherence to established policies, plans and procedures. The analysis concepts and techniques being described in this chapter are generally not applicable to the reporting phase, therefore it will not be discussed beyond this point.

The four phases -- assignment planning, review, evaluation and verification -- are described in detail in Volume II, Part 1, of this Handbook, "The Internal Audit Assignment Process". Appendix I at the end of this chapter summarizes these selected phases and sub-phases of the audit process by applicable, relevant analytic techniques (listed in Table 2). The following provides highlights of a representative set of these analysis techniques which are useful for auditing.

Elaboration of Analysis Techniques

Table 2 presents an overview of the analysis techniques from the perspective of a general classification of disciplines or fields of study and application. The classes of techniques are mainly drawn from non-auditing fields, with some overlap of currently used auditing methods. For example, the set of techniques under the first column (denoted, for simplicity, "Flowcharts/Networks/Descriptive Modelling") make up most of the tools commonly used by the modern internal auditor. Since much audit literature already exists on these techniques (see Appendix II), the selected techniques highlighted in the remainder of this chapter are taken from the remaining classes of techniques.

Note that in Table 2 there is a natural ordering of complexity of techniques as one moves from simple concepts, techniques and methods (such as flowcharts and networks) to more advanced, current techniques and methods. In turn, there is a parallel emphasis on the level of knowledge and experience required of the auditor for the proper use of the more advanced techniques and progressively more of a need to employ specialists in their application.

The overall purpose of the following sub-sections is to highlight briefly the essential nature and application of the chosen technique within the audit process. Details on the methods themselves can be found in the appropriate references listed in the Appendices.

Before proceeding with the descriptions of the selected techniques, a brief note on the general classes of analysis concepts and techniques is warranted. The seven headings in Table 2 -- Flowcharts/Networks/Descriptive Modelling; Decision Theory; Management Science (MS)/Operations Research Research (OR) Theory; General Systems Theory; Economic/Financial Analysis; Sampling Theory; and Evaluation/Control Theory -- represent a rich cross-section of disciplines and domains of study taken mainly from non-auditing literature sources. These general classes are not exhaustive nor are they independent of each other. In some classes, an ascending hierarchy of complexity is presented in the arrangement of the techniques (e.g. in classes: Flowcharts and Networks; Decision Theory; General Systems Theory; Economic and Financial Analysis) as one moves down the particular column of the table. In other classes, the ordering is simply in line with the audit process phases (e.g. Sampling Theory; Evaluation and Control Theory). Many of the individual technique categories contain multiple techniques, methods and models (e.g. the Sampling Strategy category under the Sampling Theory class breaks into a number of sampling techniques appropriate for statistical and non-statistical auditing: physical unit sampling - attribute or variable; dollar unit sampling; etc.). Only selected techniques or models will be addressed in the following sub-sections, and within these - in most cases - only one or two individual techniques or models will be highlighted. In any case, all techniques have appropriate references listed in the relevant Appendix (II to VIII) at the end of this chapter; this source material is also cross-referenced to the major phases and sub-phases of the audit process in Appendix I.

Decision Theory

Issue or Problem Analysis Models

Within the Decision Theory literature and associated management science communities, a number of useful models are currently being used to aid the designer, problem solver, decision-maker, and (analogously) the auditor, in addressing issue or problem definition, formulation and analysis.

The purpose of these issue or problem analysis models is to allow the users to tackle the particular issue/problem in the most effective manner by first examining their own way of thinking or addressing the concern in the first place. (See Appendix III for references.)

For example, the typical problem-solving procedure, as depicted in Figure 5, which instinctively leads to questionnaire designs, data collection and processing, is first put to its own test. A number of fundamental questions are first posed in order to help create a better understanding of the issues, so as to improve the solution process. For example, the following questions are addressed in R.S. Stainton's "The Question is More Important than the Answer" (Appendix III, A.1.):

- What is the problem?
- Whose problem is it?
- How will I know when I have found a solution?
- Who will benefit?
- Who will suffer?
- What are the constraints? How important are they?
- How flexible are they?
- Is there more than one objective?
- Is there a hierarchy of objectives?
- How long is the solution expected to last?
- How do I know when I have sufficient facts?

TYPICAL PROBLEM-SOLVING PROCEDURE

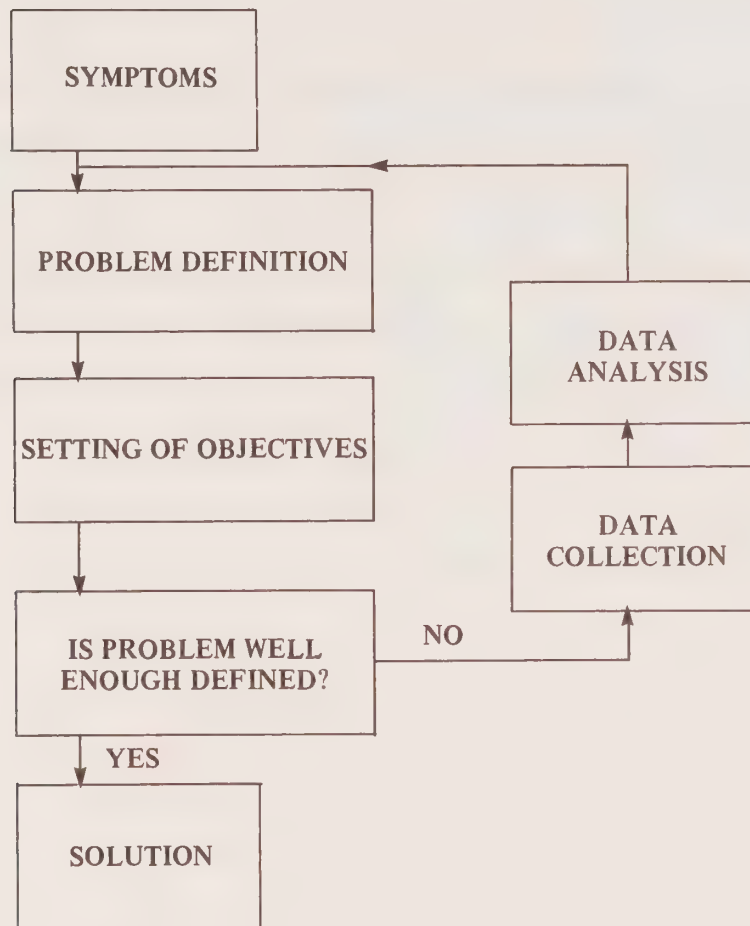


Figure 5

- When will other factors enter into the problem?
- In what ways may the problem be redefined?
- How might solutions cause other problems elsewhere?

A variant of the foregoing approach is to begin the problem-solving process from a dissolve perspective (i.e. addressing what ought to be), then proceed to either a solve (what is?) or a resolve (what can we do?) line of thinking. This problem-solving process (described in detail in the reference found in Appendix III, A.4) tends to focus on the root definition of the problem, recognizing first the perspective of the client (auditee). This process does not depend on data. It may lead to a redesign of the whole process under study. Strong interpersonal and communication skills are required for the typical management-level application of this technique. In practice, this model approach usually leads to problem-reduction, and some trade-off solutions in the solve (i.e. optional answers to bounded sub-problems) and dissolve (i.e. managerial compromise or "satisfice"⁷ approach to solutions) components of the model.

With respect to the audit process, the scope and use of these types of problem analysis models is broad, practical and immediate. For example, this technique can be applied to the following phases of the audit process:

Assignment planning:

- in the development and definition of audit scope parameters (such as nature of auditee, audit work required and type of audit suggested) and audit objectives (such as criteria formulation);
- in the determination of auditability, audit risk and materiality/significance; and

7 Herbert Simon's term for the situation where the manager takes the pragmatic way out and adopts a workable (good enough) solution to a problem, rather than attempting to optimize, (See Administrative Behavior, 2nd Edition, Macmillan, 1957).

- in the communication of audit scope, objectives and approach to management.

Review:

- in the elaboration of the audit issues so as to determine, clarify and confirm the purpose, scope and objectives of the audit entity; and
- to assist the development and, in particular, the objectivity of predetermined controls (model), which form the basis for analysis and evaluation of the existence and effectiveness of controls.

Evaluation:

- in assisting in the judgments or decisions related to the significance and interpretation of various effects of control weaknesses, by confirming these assessments with the problem formulation and solving process so as to present a consistent and relevant set of findings;
- in assisting in the development of a detailed verification plan, so that techniques appropriate to the audit objectives and the nature of the audit entity are chosen; and
- in assisting in the analysis of causes and effects of problems identified in the audit entity, so that audit findings and conclusions are stated clearly and unambiguously.

Verification:

- in assisting in the further review and development of audit criteria, or the selection of the most appropriate method of testing; and
- in assisting in the substantiation and verification of inefficiencies and weaknesses in the audit entity, particularly since these findings relate back to the audit issues and management concerns.

The use of these issue or problem analysis models and techniques should become part of every internal auditor's tool kit for conducting audits of any kind (e.g. program, function, systems, special, etc.). These techniques are easy to learn and highly useful and relevant to the audit process. Appropriate use should produce significant beneficial impact on audit results, both at a general and specific level of application.

Bayesian Decision Models

Within Decision Theory, there exists a powerful set of Bayesian modelling techniques that allow the auditor to rigorously address certain unknown but testable situations. In particular, Bayesian frameworks use a general mathematical modelling approach to express the entire decision space of the user's problem in terms of numerical quantities related to risk. These quantities, called posterior probabilities, assist the decision-maker in rigorously stating the solutions to the problem in terms of her or his a priori (subjective) knowledge of the problem as new empirical evidence becomes available. (See Appendix III, D for references.)

With respect to the audit process, the Bayesian model technique would typically be used in the verification phase during detailed audit testing. For example, wherever statistical sampling is used, the Bayesian approach might serve as a complementary tool to the classical theory of statistical inference. It provides the auditor with a logical framework within which to relate both judgment and sample evidence, in proper proportions, to the economic consequences of possible actions.

To outline the technique in its simplest form, suppose we wish to investigate some tentative audit findings during the verification phase based on a verification sample. Assume that the (prior) probability, based on the results of the review phase, that some transaction or control process is working satisfactorily is estimated as X per cent. Now suppose that a verification sample shows that the probability that it is working satisfactorily is only 1/2 of X per cent. The formal Bayesian procedure would calculate the new revised (posterior) probabilities based on this new evidence in the presence of the original information (details not shown here). Depending on the size and coverage of the verification sample, the auditor may have to revise the probability of satisfactory control significantly downward or upward.

Bayesian models and analyses take into account subjective probabilities and expected gains or losses in much the same way as they are intuitively considered by the managers or decision-makers. A priori judgment is important if sample information is meagre, as is the case in most small samples. As the sample size increases to the point where the evidence is overwhelming, a priori judgment may well be discarded. In the limiting case where a census is taken, the posterior probabilities of the Bayesian procedure approach those shown in the sample itself (i.e. classical sampling results).

The use of Bayesian models and techniques may well have specialized but useful application in various verification-phase situations for the internal auditor. The simpler models are relatively easy to learn, particularly when illustrated with a variety of case studies. Appropriate use should assist the auditor in completing the requirements of detailed audit testing and other verification procedures for particular situations.

Management Science and Operations Research Theory

Decision Tree Analysis

Within Management Science (MS) and Operations Research (OR) Theory, a number of useful types of decision analysis are currently being used by managers to solve complex problems. These consist of: decision tree analysis (to be highlighted below), probabilistic forecasting and multi-attribute analysis. The second and third types noted here have been developed from decision tree analysis; the former uses probabilistic outputs of decision analysis as inputs to the development of forecasts (which, in turn, can be used to support decisions about planning, investment and marketing, for example). The latter type evolved from decision analysis where there was a need to balance multiple objectives and provides a way to quantify and trade off the multiple factors that affect the decision, i.e. the final choice of alternative.

The purpose of decision tree analysis is to display the anatomy of sequential decision problems; that is, action choices available to a decision-maker (auditor) and options that are determined by chance. The decision tree allows for the calculation of the expected payoff for a series of sequential choices. (See Appendix IV, A for references.)

The general decision tree structure is depicted in Figure 6.

The construction of the tree should follow the detailed guidelines given in the aforementioned references, which also contain many illustrations and case studies of the technique.

With respect to the audit process, the use of decision tree analysis would typically occur in the following phases:

Assignment planning: for example, during the development of the audit workplan (so as to more accurately establish optimum final choices from alternative resources and scheduling mix).

Review: to assist the auditor in the validation and assessment of data and systems accuracy based on a small sample.

Verification: to assist the auditor in further developing audit procedures for verification testing (where minimum cost of effort or maximum benefit of coverage and depth of audit is sought), and to assist or perform any particular verification procedure (where sequential decisions or choices are made under uncertainty).

The use of decision tree analysis is mainly seen as a complementary tool to other procedures or tests and for particular situation applications (such as in the planning processes to examine the allocation of resource decisions). This basic type of decision analysis is easy to learn, and is well documented and illustrated in the literature. Auditors should be able to use this technique whenever the particular situation arises; it supports objective and unambiguous decisions in the presence of multiple choices or alternatives for action.

GENERAL DECISION TREE STRUCTURE

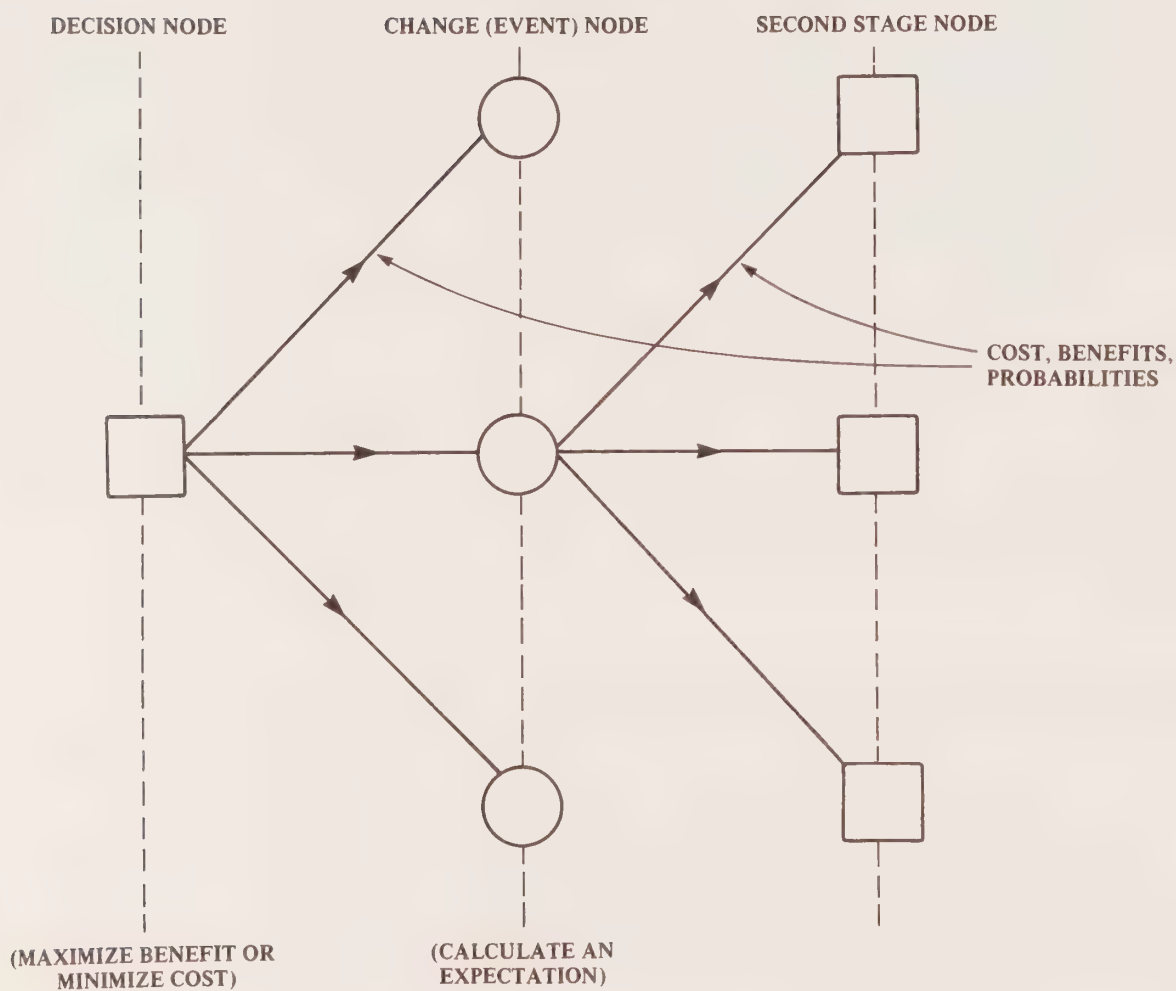


Figure 6

Risk Analysis

From MS and OR Theory, a set of techniques commonly known as risk analysis are increasingly being used in adjacent fields to assist analysts and managers to make decisions under uncertainty.

The purpose of risk analysis in the decision-making context is to extend or elaborate upon the measure of value used for choosing from decision alternatives. For example, the value of control to managers is not a simple linear function of the amount of cost savings or net benefits. Essential control and the form it takes is most important, while successive increments of control have less and less subjective value.

In order to assist the decision-making process in an uncertain environment, a quantitative measure of the decision-maker's attitude toward risk is needed. A risk equivalence measure, called utility, is typically used to express the decision-maker's aversion to risk in non-monetary units, which can more realistically represent any non-linearities in the judgment process. The decision criterion is then to pick the alternative with the highest expected utility, rather than the highest expected monetary value.

The procedure for making decisions in an uncertain environment involves these steps:

- define the possible events that can occur;
- define the actions that can be taken;
- determine the value (in dollar or utility) of each action-event combination;
- describe the decision-maker's uncertainty about the events by a set of probabilities;
- find the expected value of each alternative action by multiplying its value for each event by the probability and summing; and
- select that alternative with the highest expected benefit (or utility).

To specify the above decision procedure is merely to organize the decision-making process in a systematic and logical fashion. All decisions made under uncertainty go through these steps, although some steps may be done in an intuitive manner. (See Appendix IV, C.1 and C.2 for references.)

A number of similar techniques for analyzing value decisions and model implications (from the perspective of decision-making under uncertainty) are described in the references found in Appendix IV, C.3, C.4 and C.5.

With respect to the audit process, this technique can be applied to the following phases:

Review: in the initial assessment analysis of the existence and effectiveness of management controls, where much uncertainty and little quantitative data is usually the norm underlying the decisions at this stage in the audit.

Evaluation: in analyzing the effects of perceived operational weaknesses expressed either in quantitative or qualitative terms, or for studying various hypotheses on the reason for, and the significance of, system weaknesses such as audit criteria deficiencies.

Verification: in assisting the further development of audit criteria, or to analyze collected evidence against various decision implications (as part of the cause and effect analyses).

The use of risk analysis techniques in the auditing context is evolving, particularly with respect to making or assisting decisions under uncertainty. These techniques are relatively simple to learn but much work is needed in bridging the gap to particular audit applications. Appropriate use should assist the auditor in more objectively addressing decision issues and outputs at specific points in the audit process.

Market-research Models

Within MS and OR Theory, a broad set of models – known under various names, such as market exploration or market analysis, or as denoted here to represent all such models, market research, – are used by decision-makers essentially in resolving the questions: which product characteristics or market strategies are most influential in the development and marketing of a successful product. In the auditing context, this might translate into "what process, structure, management or control characteristics are most likely to result in satisfactory operations or results?"

Market research is primarily concerned with the discovery and the interpretation of facts or patterns of facts. Information is usually assembled in various ways, for example by: iterative searches, statistical analysis, mail questionnaires, telephone interviewing, direct interviewing, and designed seminars. Interviewing itself may be by questionnaire, presubmitted or used as a checklist, structured or unstructured; of an exploratory nature; or conducted as the pilot preparation for an extended program. Tailored and automatic analysis methods are used to highlight data structures and relationships, such as conjoint analysis, multi-attribute utility analysis, factor analysis, regression analysis and so on.

Marketing data can be classified into primary facts, corresponding to reasonably firm sequences of behaviour, based on historical data; and secondary or derived facts (i.e. which are much less firm, stable or objective) such as those which are:

- frequently based on opinion,
- often of a transitory nature,
- usually about a contingent future,
- vulnerable to subsequent action,
- subject to sharp discontinuities,
- fraught with uncertainty, and
- seldom susceptible to proof.

Although checklists are employed, interviewing tends to be unstructured in exploratory work, with information interpreted progressively, to make the most of any leads uncovered. Questioning is so directed as to discern the underlying facts, significance and reasoning. By correlation in a matrix, data which may prove unobtainable directly may be inferred and then confirmed. Such information serves as an aid in decision-making.

Many of the market-research models have a direct link to economic and statistical models. In addition, statistical and stochastic process models (e.g. Markovian process models, Bayesian analysis models) are some of the more advanced applications of this approach to decision-making. (See Appendix IV, E for references.)

With respect to the audit process, the approach inherent in the use of these models can be used at various phases of the process, but is most applicable in the verification stage of the audit. The emphasis of this methodology is on the logical structuring of the gathered data (e.g. primary, secondary), confirmation of the data through various sources (e.g. dependent, independent or third party), and rigorous assessment of the data using a battery of statistical techniques.

The use of market-research models, methods and techniques in the auditing context is new but has promise. Much insight into all aspects of data rigour and meaning could be gained by the systematic application of some of these well-tested techniques: they are relatively easy to learn, assume some use of statistical methods in their more advanced applications, and could significantly improve (in the longer term) the associated decision-making processes of auditors and managers.

General Systems Theory

Organizational Analysis Models

Within General Systems Theory, there is a broad class of macro-oriented models and techniques for assisting managers in the design, development and implementation of better (e.g. more effective) management systems. It is a given that the ways in which organizations are designed and the environments in which they operate make a difference in organizational performance.

One important trend in addressing the problem of organization assessment in a reliable and valid way is the increasing application of system frameworks or models, which employ measurement instruments and processes that are scientifically valid and practically useful for assessing organizations on an ongoing basis. (See Appendix V, B for references.)

Such an approach to organization assessment has been well documented in "Measuring and Assessing Organizations" (Appendix V, B.1). The measurement instruments of this approach, denoted Organization Assessment Instruments (OAI), are highlighted below.

OAI is a set of questionnaires and survey procedures for measuring the dimensions included in the OA framework; that is, various characteristics of the context, structure, and behavior of the overall organization, work groups and jobs. The measures in the OAI, which have proven to give good indications of reliability (i.e. reproducibility of results) and validity (i.e. substance and integrity of results themselves in relation to the objectives), explain large variations in the efficiency, effectiveness, and job satisfaction of different types of organizations, work units, and jobs. Specific areas where improvements and revisions are needed can be identified with these measures.

The basic process followed in OAI technique development is exemplified by Table 3. It illustrates the characteristics of questions requiring answers if we are to understand organization effectiveness.

In practical terms, the OAI represent an attempt to develop an organizational information system within the host organization. Once developed and implemented, data obtained periodically with the organizational and performance information systems are linked together as an overall OA management information system (MIS). This system, in turn, when incorporated as part of a data-based management and organizational development process, can provide managers and analysts with systematic, longitudinal information for addressing basic questions about the performance of their organizations on the basis of how they are structured and the environments in which they operate.

With respect to the audit process, the use of organizational analysis models bear directly on several audit process phases:

Review: in assisting the development of predetermined control models (so that the resulting control model is more appropriate to the characteristics of the audit entity).

Evaluation: in assisting with or complementing the evaluation of the existing management control framework against the predetermined model (such as confirming whether the existing control framework is appropriate to the entity from an organizational effectiveness perspective.

Table 3
Characteristics of Questions Requiring Answers to Understand Organization Effectiveness⁸

| Nature of Question | Normative, Subjective | Positive, Methodological | Positive, Analytical |
|--|---|--|---|
| Nature of Solution | Value judgments on goals, criteria, and standards for evaluation | Descriptive set of measures and data collection methods | Theory, hypotheses, or data which treat effectiveness as the dependent variables |
| Knowledge Base of Solution | Introspection, intuitions or "gut" feelings | Psychometric theory, and discipline of operationalizing a concept | Organizational theories, observations, and practical experience |
| Process Followed to Obtain Solution | With the help of the analysts, decision makers articulate: <ol style="list-style-type: none"> 1. reason for evaluation 2. goals for organization 3. criteria to evaluate goals 4. standards or criteria which they will use to judge satisfactory goal attainment | Analysts and Technicians: <ol style="list-style-type: none"> 1. operationalize goals criteria and standards in terms of concepts, constructs and variables 2. develop preliminary draft of measurement instruments 3. conduct pilot test and revise measures 4. outline procedures for data collection | Analysts and Decision Makers: <ol style="list-style-type: none"> 1. develop conceptual model to explain effectiveness 2. design and conduct research study 3. analyze and evaluate data to test model 4. select and implement most appropriate action |
| Criteria to Evaluate Internal Validity of Solution | Decision makers' ability and honesty in articulating goals, criteria and standards | Quantitative and qualitative indications of reliability and validity of measures | Satisfy criteria threatening internal validity Type I and II errors Satisfy criteria threatening external validity |
| Criteria to Evaluate External Validity of Solution | Generality is limited to the decision makers and groups who either participated in process above or have values and beliefs similar to those presented in the solution | Technical quality and social acceptability of measurement instruments and procedures by decision makers | Willingness of decision makers to take action based on the results |

8 Extracted from Van de Ven, A.H. and Ferry, D.L., Measuring and Assessing Organizations, Wiley, 1980, p. 26.

Verification: in assisting the development of more detailed audit criteria before proceeding with further procedural testing of controls.

The use of organizational analysis models should be part of every internal auditor's arsenal of techniques, particularly for the evaluation phase. These techniques are easy to learn, highly useful and relevant to the audit process, but most effectively applied when tempered with previous experience. For example, many parallel developments at both a conceptual and an applied level exist between the OA-MIS model and the Predetermined Control Model, as described in other parts of the Handbook. Appropriate use should produce a significant impact on audit results, primarily at a general (managerial) level of application.

Goal Programming Models

Within General Systems Theory, in the Research and Development management literature, there is a trend to more elaborate but realistic models that take a goal-directed, contextual and systemic perspective when dealing with organizational issues. (See Appendix V, C for references which provide a starting point to this literature.)

The purpose of goal programming models, as defined in the preceding context, is to better understand the required relationship between goals, resources, structures and processes (e.g. for the audit entity), and incorporate this knowledge into theories and designs for more effective structures and processes within the organization. Figure 7 illustrates the organizational implications of contextual goals and generic factors.

Organizational goals and their corollary - constraints - are built into decision-making processes which are conditioned by context (e.g. the organization's decision making and communication structures, environmental constraints, state-of-the-art technology). Goals are part of a package which includes beliefs, actions, and processes of goal-setting and translation into action - a package which is tied together and given meaning by the context. Goals and constraints are how the implications

ORGANIZATIONAL IMPLICATIONS OF CONTEXTUAL GOALS AND GENERAL FACTORS

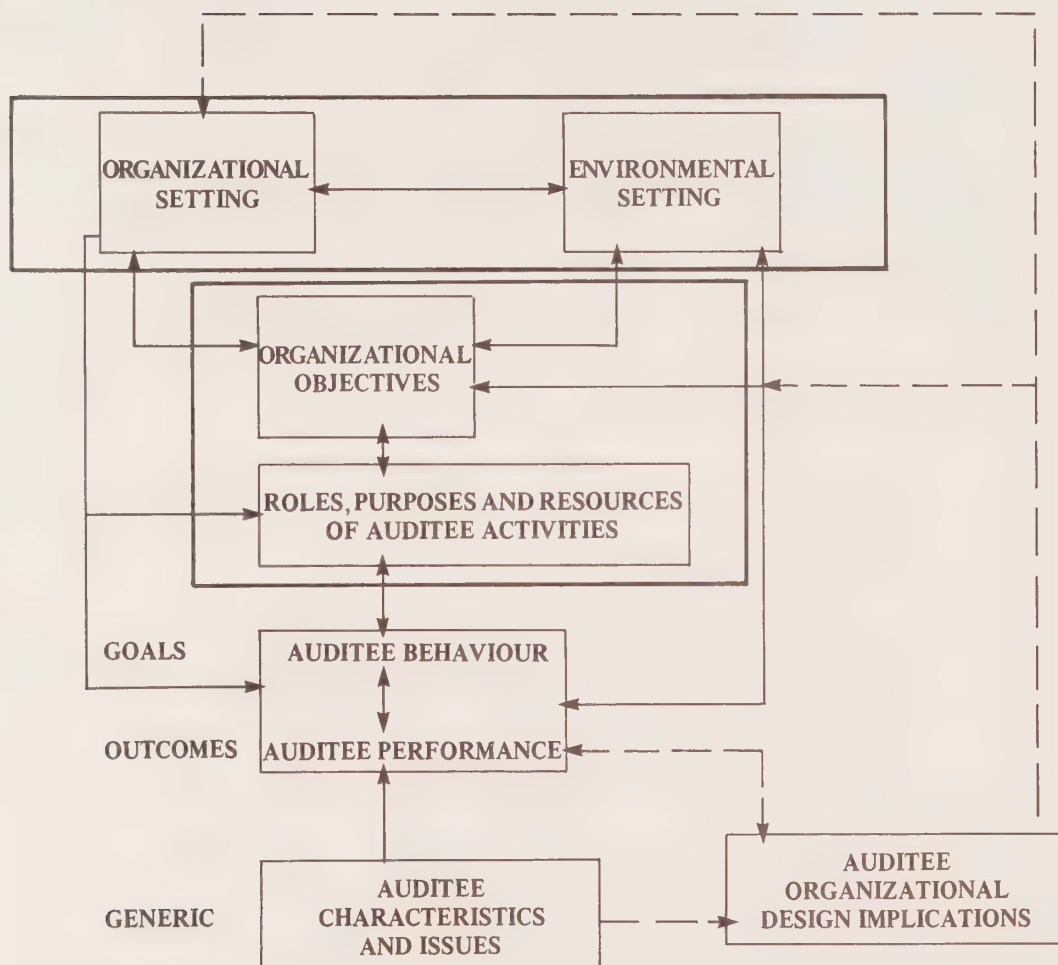


Figure 7

of the environment show up within an organization, mediated by organizational processes and the members' intentions and beliefs. Goals, therefore, should continually be examined within contexts, and contexts in relation to goals. More detail related to goal-profile frameworks and their application to organizational effectiveness issues can be found in the references found at Appendix V, C.2 and C.4.

With respect to the audit process, the potential scope for use of this type of "goal programming" model is significant for several major audit functions:

Review: in assisting the development of predetermined control models appropriate to the characteristics of the audit entity, or in assisting in the preliminary determination of potentially significant audit issues related to uneconomical or inefficient operations, given the auditee context.

Evaluation: for example:

- (i) assisting in various evaluative tasks, such as answering the question "is the existing control framework appropriate to the entity?";
- (ii) determining which management controls are essential to the effective operation of the auditee system, given the auditee goals and context;
- (iii) assisting in the cause and effect analysis stage, by appropriately contexting the issues under investigation.

Verification: assisting in the development of more detailed audit criteria for additional testing of controls.

The use of goal programming models is an advanced technique which may be used to assist the internal auditors in future audits. Much work still needs to be carried out before the technique can be properly introduced into the audit process in a formal manner.

The positive benefits for, and impacts of the technique on, subsequent audits may be quite substantial. For example, the more an auditee is subject to external influence in its goal determination, the more important it is for the auditee to develop inter-organizational and boundary role mechanisms that permit and facilitate the required two-way interaction with respect to: what is needed; when; in what form; what is feasible; what could be possible; and so forth. The lack of such mechanisms hampers an organization's ability to be responsive.

The proper use by the auditor of goal programming models can assist the understanding of the auditee management mechanisms conditioned by these boundary constraints. This knowledge, in turn, would aid the development of reliable predetermined control models and associated criteria for evaluating the system's effectiveness.

Economic and Financial Analysis

Cost/Benefit Analysis

This general term represents a range of techniques which varies in complexity from very simple to highly sophisticated. Internal auditors already use many of the simpler, less structured versions of this technique, but much more emphasis on the cost implications of the internal audit process and of its focus of attention, the auditee, is crucial to future effective auditing. For this reason this technique is reemphasized here.

Within the general class of techniques denoted Economic and Financial Analysis, cost/benefit analysis is one of the most obviously applicable in internal auditing. Cost/benefit analysis refers to a procedure where the economic efficiency of an operation or program (e.g. audit object under examination) is determined, usually expressed in monetary terms as the relationship between costs and outcomes. Cost-effectiveness (discussed under Evaluation Control Theory) is another.

Cost/benefit and cost-effectiveness analyses can range from simple to sophisticated technical procedures. In some situations, formal complete efficiency analyses are either impractical or unwise. For example, the required technical procedures may

be beyond the technical expertise of the project team, or may be unnecessary, given either the very minimal or the extremely high efficiencies of the operation or program. In addition, the practice of expressing political, ethical or other considerations, in economic terms regarding particular input or output measures, may discount the usefulness or relevancy of this type of analysis for a given application. Nevertheless, managerial choices between alternative modes of operation or competing programs are, at least in part, based on relative payoffs in economic terms.

A comprehensive cost-benefit analysis requires estimates of the benefits of the audit object (e.g. program, function, mechanism or operation), both tangible and intangible, and the costs of undertaking the program action, both direct and indirect. Once specified, the benefits and costs are then translated into a common measure, usually a monetary unit. The assumptions underlying definitions and measures of costs and benefits strongly influence the resulting conclusions.

Note that all the requisite data for proper cost/benefit calculations are seldom available. Where benefits are undefined, cost-effectiveness is the more appropriate technique.

Examples of the methodology of cost/benefit analysis abound in the literature. A good starting point is provided by the references found in Appendix VI, D.

The specification, measurement, and valuation of costs and benefits - procedures that are central to cost/benefit analysis - pose two distinct problems. First is the identification and measurement of all program costs and benefits and the second is their expression in terms of a common denominator (e.g. monetary values). A number of approaches have been specified for monetizing outcomes or benefits: direct measurement of monetary benefits; market evaluation; econometric estimation; use of hypothetical questions (e.g. "what if" scenarios); and so on. For the results of a cost/benefit analysis to be valid and reliable and to reflect fully the economic effects on the entity under examination, all relevant components must be included.

With respect to the audit process, cost/benefit analysis techniques can be used in the following phases of the audit process:

Assignment Planning: in deciding on significant audit areas and on resource allocation.

Evaluation: in studying the significance (in monetary units) of program weaknesses identified by the auditor, or in substantiating the significance of particular findings during the causes and effects analysis stage of the audit.

Verification: in performing substantive testing of particular operations - where an economic perspective is valid and evidence on operational control efficiencies is called for or in determining whether it is cost effective to do additional verification.

The use of cost/benefit analysis techniques is well suited to particular applications in the audit process, primarily for substantive testing where an economic perspective is valid and suggested. The more sophisticated versions of these techniques should only be used by experienced auditors or specialists with a background in the discipline. Increasing use of this technique in appropriate audit situations will lead directly to more effective auditing.

Sampling Theory

Sample Design

Within sampling theory, a large body of literature both in the auditing and non-auditing fields exists on the application of statistical sampling to problem measurement, hypothesis testing (confirmation) and inference development (i.e. reliable and valid projection of sample findings to predetermined populations of interest). References in Appendix VII highlight some of the more pertinent sources for the auditor.

Due to the large number of good references on this subject, the following description will only highlight some of the key principles associated with sample design and their interface with the audit process.

An overview of the sampling framework for the auditor is provided by Figure 8. The sample design stage of a study encompasses all aspects included in this figure. The stages denoted (sampling strategy, sampling implementation and sample evaluation) will be described in more detail in the following sub-sections.

The basic principles common to most sampling plans and testing activities -whether they are strictly an applied, statistical approach or the traditional, for auditors, nonstatistical or judgmental approach - are:

- Auditor's Objective
 - Testing consists of selecting and examining a group of items (a sample) to make assessments about the entire group of items (the population) from which they are drawn.
- Determination of Sample Size
 - The number of items selected should be sufficiently large so that there is an acceptable probability that the sample results will approximate the actual parameter values of the population that they are drawn from.
- Method of Sample Selection
 - Sample selection should be performed on a representative basis so that an appropriate cross-section of the population will be examined.
- Projection and Interpretation of Results
 - Conclusions drawn on the basis of a sample should recognize that errors discovered in a sample are likely representative of the errors that you would expect to find in the population, and that the actual extent of errors in the whole population likely falls within a range around the estimated extent of errors determined by projecting the results found in the sample.

AN OVERVIEW OF THE SAMPLING FRAMEWORK FROM THE PERSPECTIVE OF THE AUDITOR

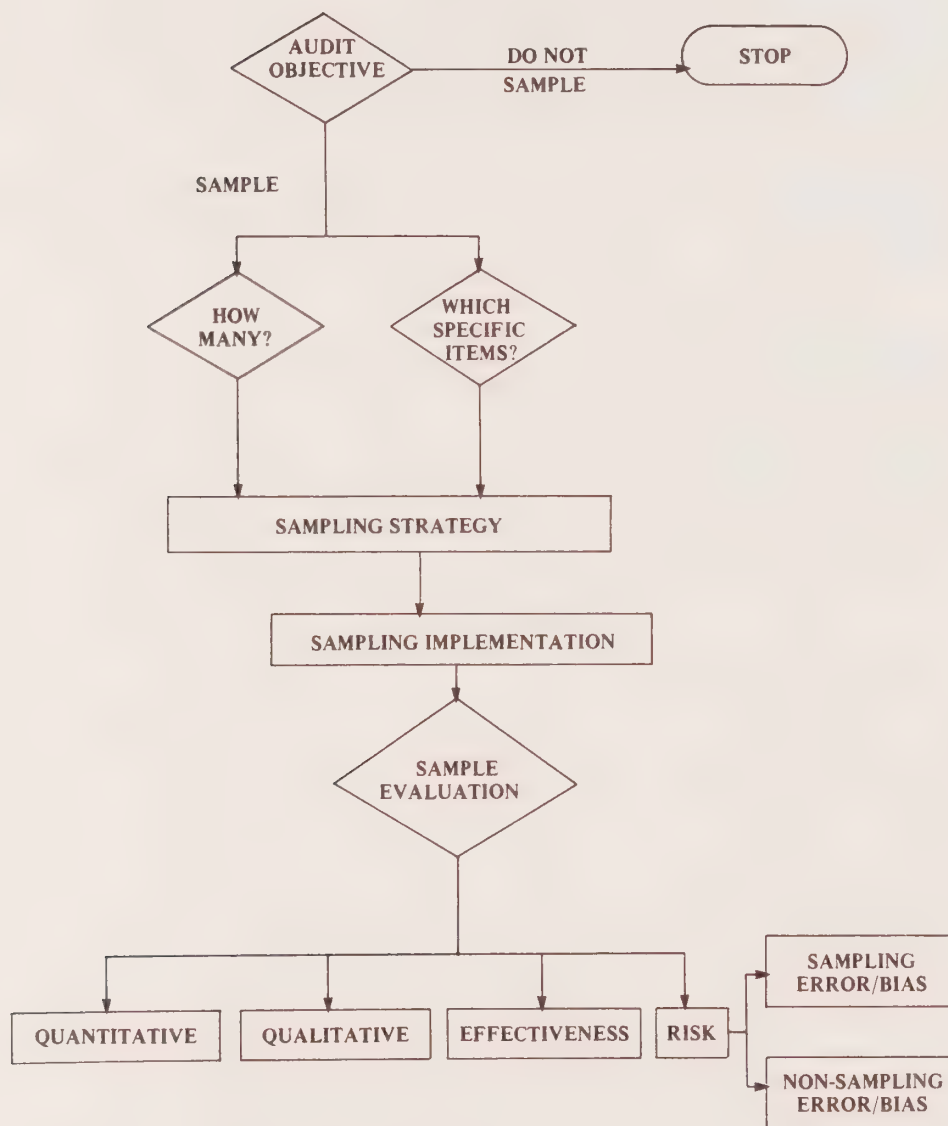


Figure 8

The logical sequence of steps, although usually iterative in nature, for the actual design of a sampling plan is summarized below. (Note that these activities typically are completed during the planning stage of an audit.)

- Avoid early discussion of sample size.⁹
- Formulate the general goals and uses of the survey.
- Specify the frame (i.e. the entire listing of units in the population under study).
- List the variables to be measured and the criteria to be used.
- Discuss the sampling strategy (e.g. sample like and unlike groups, lightly or heavily; spread the sample out; create artificial groups for unknown segments of the population; special treatment for special cases; for unequally sized groups use probability proportional to size sampling).
- Make the final sample decisions.
- Choose the estimators.⁹

9 Important Note:

One should avoid an early discussion of sample size, and choose the estimators at a latter stage in the design sequence because the selection of a sample size (an estimation procedure) requires firstly the specification of both an estimator and the method of sampling, except in those instances where information is available from previous studies, or when a pilot study is a possibility. For example, assuming the use of the sample mean and simple random sampling will result in a determination of sample size quite different from assuming the use of a ratio estimator and a cluster sample design. What is really needed - given the pressure of budget considerations for an early discussion of sample size - is a "sample allocation decision" that uses the budget in the most efficient way. This means choosing both good estimators and good methods of sample selection; that is, sample designs that have the best chance of being efficient.

With respect to the audit process, where sampling requirements are pre-determined, sample design technology plays a significant role in the assignment planning phase, with lesser involvement in the later phases - except as refinements to the design (e.g. in the review phase when carrying out a system walk-through with a small sample to verify the accuracy of the data collected; in the verification phase when choosing the most appropriate method of testing based on the established features of the population under study).

For example, in the assignment planning phase, knowledge and experience with sample design theory and practice can:

- assist the development and definition of audit parameters (such as providing solid arguments for or against a specific type of audit;
- assist in identifying the audit risk and the materiality or significance underlying potential audit approaches (i.e. for those areas of inquiry which seem appropriate for providing the auditor with insight (or evidence) into (or of) significant operations of the entity); and
- assist in detailed planning (e.g. resource allocations, scheduling, audit objectives, approach, budgeting), and communications of the audit plan to management.

Where sampling requirements are not pre-determined they may be identified in the evaluation phase; to be carried out in the verification phase, as before.

The use of sample design theory and practice in the planning, conduct, analysis and evaluation of audits should be fundamental knowledge for all internal auditors. The essential basics and principles of sampling are well documented and easily taught to beginners. More sophisticated use of design methodologies can be readily obtained by employing appropriate expertise on the audit team (e.g. typically, an experienced survey statistician). Appropriate investment in this technique will pay significant dividends in producing quality audits, both at a general and specific level of application.

Sampling Strategy

The purpose of this sub-section is to further highlight the context and meaning of sampling strategy within the sampling theory framework.

From the perspective of the auditor, sampling strategy is typically that stage in the design of the audit where the auditor must decide upon how many and what kind of items should be sampled. More generally, the strategy must encompass decisions related to:

- the nature or type of characteristic(s) to be sampled (e.g. attribute: yes or no; variable: continuous scale, expressed in dollars; or both);
- the nature of the sampling unit (e.g. if the account of an individual is to be sampled, then the realm of physical unit sampling is entered - which is based on much different theory and application than dollar unit sampling, where each dollar recorded in the population is sampled directly regardless of the account identification at the first stage of selection);
- overall sample design configuration, and the respective sample size alternatives and associated audit or sampling risks;
- the nature of the selection process itself (e.g. statistical versus non-statistical based selection procedures);
- the estimation (inference) procedures for projecting the sample results to the target populations; and
- the data collection, processing and monitoring procedures (e.g. quality control checks) for the implementation stage of the audit.

In addition, sampling strategy addresses many of the detailed technical issues of the audit during the earlier phases or sub-phases. For example, treatment for anomalous or highly unusual, data-dependent findings; missing, unavailable, beyond scope, or non-response data; and measurement or other sampling problems; is at least tentatively dealt with by the end of this stage.

With respect to the audit process, sampling strategy impacts the process in three distinct areas:

Review: in the initial verification of the accuracy of the data collected, and the subsequent ramifications for the sample design in succeeding phases of the audit.

Evaluation: in substantiating various data-dependent hypotheses of concern to the auditor, so as to prepare the more detailed sampling strategy for the subsequent verification testing of this concern.

Verification: in communicating various sampling options (e.g. different methods of verification testing) to the audit manager, highlighting the potential ramifications of each option.

The use of sampling strategy principles and practice in an auditing context is best achieved when carried out in conjunction with staff specialists. Auditors should, however, know the basic principles and applications of sampling strategy to ensure efficient and effective auditing at all levels of application.

Sampling Implementation

The purpose of this sub-section is to further highlight the stage in the execution of a sampling plan most commonly known as the implementation or execution stage. Other names for this activity are: data collection, fieldwork, or verification. The emphasis, however, will be on the techniques available to the auditor in carrying out the required tasks of this stage.

Referring to Figure 8, it is seen that this stage bridges the sampling strategy and sample evaluation stages in the overall sample framework. Generally, the methods for collecting statistical data are:

- direct observation;
- personal interview;
- mail interviews;

- telephone interviews; and
- controlled experiment (e.g. particular time and motion efficiency studies).

Quality control procedures are typically employed in the sampling implementation and processing stage to ensure that the errors of coding, interpreting, transcription, editing and the like are within acceptable statistical limits, hence under the control of the auditor.

Data analysis of audited items, procedures or systems of interest occurs during this stage of audit execution; it can range from simple descriptive, non-statistical, summaries of collected data, to sophisticated statistical analyses that rigorously test predetermined hypotheses related to the operation of the audit entity (e.g. correlation and regression analysis; discriminant or logistic regression models; categorical analysis models; etc.).

With respect to the audit process, sampling implementation impacts the process in three areas:

Review: in assisting the limited testing procedures, to verify the accuracy of the data collected - this activity typically involves a brief walk-through of the system to verify various aspects of the accuracy of the system or data under study - information quite useful to the formalization and refinement of the plan for sampling implementation.

Evaluation: in assisting the evaluation of the existing management control framework against the predetermined model - which is typically supported by evidence gathered by various means for specific evaluative purposes.

Verification: in determining the principal characteristics of the audit populations to be tested, the best source for selecting a sample (and how to do it), and the most appropriate method of testing - various aspects of the sampling implementation methodology will be required for successful detailed, verification testing.

The use of sampling implementation principles and practices in auditing is a basic prerequisite to conducting sound and reliable audits. Each auditor should be familiar with most of the well documented and easy to learn principles and techniques. The more advanced methods can be applied with the assistance of experts in statistical methods.

Sample Evaluation

This stage of the sampling framework (see Figure 8) is mainly concerned with the formal analysis of previous audit stages and all collected data that affect the audit findings, conclusions and recommendations.

Sample data can be evaluated from several perspectives, such as:

- quantitatively: where, for example, population error rates and impacts are projected from the sample findings;
- qualitatively: where, for example, error classification and analysis is carried out to explain the particular nature of the errors;
- for efficiency: amount of useful output gained from the sampling process for the effort exerted;
- for effectiveness: in terms of the validity and reliability of the collection instruments used and the objectives achieved; and
- for risk: expressed in quantitative terms (e.g. sampling error or bias) and in qualitative terms (e.g. non-sampling error or bias related to non-response, selection problems, processing error, and so on).

A more detailed checklist of logical and statistical problems with sample data analysis, which is usually addressed in this stage by the auditor, follows:

- Data Problems
 - distributional observations
(e.g. extreme cases, range problems, small sample sizes, skewed distributions);
 - measurement problems
(e.g. missing data, inapplicable variables, scaling problems, non-linearity of measures);
 - sampling problems
(e.g. weighting of cases, response rates, statistical significance and/or confidence levels, bias in estimates).
- Model Problems
 - failure of data or model to meet required assumptions;
 - transaction or rounding error (e.g., advanced techniques);
 - non-linearity of relationships;
 - non-additivity of relationships;
 - correctness and appropriateness of formulas;
 - computer dependencies or restrictions.
- Output Problems
 - incomplete or inadequate computer program statistics;
 - labelling, annotating the report;
 - incompatibility of output with other programs;
 - technical report completeness (e.g. frame specification; sample design; statistical analysis and computational procedure; survey, sample or frame accuracy; completeness and adequacy; comparisons with other sources of information).

The types of statistical analysis methods that can be applied to any particular audit situation are too numerous to cover in this chapter. Currently, there is no general, scientific way of carrying out data analysis for all possible applications; however, much consensus exists, and is increasing, on data analysis approaches and methods for a wide array of particular applications. References found in

Appendix VII, 1-20, provide a number of good starting points for the auditor to begin or to continue this learning process.

With respect to the audit process, sample evaluation impacts the following phases:

Review: in analyzing the preliminary data collected during the limited test stage of the audit, so as to develop an initial assessment of the operation of management controls.

Evaluation: in assisting any particular sub-phase of the evaluation stage of the audit where data are required to assess specific audit issues, such as "are the data supplied by the control system accurate, representative and timely?"; in particular, the substantiation of audit hypotheses on the reasons for failure to match specified audit criteria can most effectively be addressed with sound, reliable sample evaluation data and analysis appropriate to the situation.

Verification: in conducting the detailed field testing where general or specific data and model analysis tools can be efficiently and effectively applied to achieve the test objectives. References numbers 17-23 in Appendix VII contain illustrations of a number of potentially applicable analysis tools for verification testing.

In the auditing literature, a number of analysis-driven techniques such as analytical review and risk assessment, provide particular approaches to sample evaluation similar in spirit to the context above.

The use of sample evaluation techniques and methods is an essential part of every auditing operation. Auditors should be familiar with the wide range of such tools which may be used to assist them in various phases of the audit process. Good technique coverage and documentation exists for the most common applications (e.g. descriptive statistics; hypothesis testing techniques; statistical tabular comparisons; sampling projections; correlation or regression analysis; etc.). The more advanced evaluative methods and techniques can be applied with the assistance of experts in statistical methods.

Evaluation and Control Theory

The format of this concluding sub-section under Analysis Techniques differs slightly from the above. Because of the wide range and substance of evaluation and control models in the literature, only a few highlights of those selected models (see Table 2) will be noted, along with the pertinent references. The sub-section will then conclude by briefly relating this collection of evaluation and control models to the audit process.

Strategic Planning Models

This is a suggested extrapolation of the use of well known techniques, usually associated with the strategic planning process to internal auditing. (See Appendix VIII, A for references.)

Environmental Sensing Models

These models involve the systematic application of environmental scanning methods for purposes of strategic and operational planning. In the audit context, they are applicable to development of strategic and operational audit plans, and to a lesser degree to assignment planning, particularly for the identification of relevant environmental influences on the nature and operation of the managerial control framework.

Typically, scanning or sensing covers social, political, regulatory, economic and technological conditions looking several years into the future.

Various forecasting technologies are used in the model development process, e.g. Delphi, match modelling, trend extrapolation, probabilistic system dynamics and cross impact analysis. (See Appendix VIII, B for references.)

Systems Logic Models

These models represent the hierarchy of systems and their relations in the entity under study. They provide a context for both understanding and guidance to the collection of further information, and they assist the auditor in addressing the

question "what actions should be performed to produce desired results or to operate desired processes in an authorized, economic, efficient and effective manner?"

Various audit methodologies use the system logic model approach; for example, auditors in documenting the existing auditee system (see Appendix VIII, C for references), or in the development and use of predetermined control models as previously described, use a type of system logic model.

The explanatory power of a system logic model far exceeds its capability for "proving" assertions about an organization; however, weakness in proof capability should not be taken as a weakness in the system logic model - other analytic techniques are generally needed to complement the use of the system logic model.

Behavioural Models

The application of these models, although desirable for rounding out the auditor's portfolio of skills, requires considerable additional training. (See Appendix VIII, D for references.)

Quality-control Models

These models represent the quality control perspective of an organization, system, program or activity in terms of the management systems in place and how effectively they are, or should be, performing; for example, quality assurance review techniques are available (see Appendix VIII, E.1 for reference) which continuously monitor the quality status of an audit object, and hence can be used where the auditor wishes to implement this approach.

Various quality control methodologies currently used in the literature, both auditing and non-auditing, could be directly adapted to assist the auditor at various stages of the audit process. An example can be found in "Auditing for Quality Control" (Appendix VIII, E.2) which illustrates a simple scheme for auditing a specific control task from a perspective of quality control.

See Appendix VIII, E.3-E.6 for additional source material related to this perspective.

Information Processing Models

These models are concerned primarily with the human systems of an organization from the perspective of information transfer or production agents.

These models are typically based on behavioral decision-making research, also known as human information processing research, and represent a large class of powerful frameworks that the auditor might apply directly to the audit context; for example, a successful adaptation of this type of model to the audit situation would provide a systematic methodology for aggregating control system judgments into a meaningful statement on how the system functions as a whole. (See Appendix VIII, F for references.)

Cost-effectiveness Analysis

This type of analysis refers to studies of the relationships between project costs and outcomes, usually expressed as costs per unit of outcome achieved.

Cost-effectiveness analysis requires monetizing only program costs; benefits are expressed in outcome units. This allows comparison and ranking of choices among potential programs (audit objects) according to the magnitudes of their effects relative to their cost without the necessity of expressing both costs and benefits in dollars. Cost-effectiveness and cost benefit calculations for programs whose impacts are entirely unknown and non-estimable are not possible.

Cost-effectiveness is viewed as an extension of cost benefit analysis in assignments or projects with multiple and noncommensurable goals. It is based on the same principles and uses the same methods as cost-benefit analysis. The assumptions of the method, as well as the procedures required for measuring costs and discounting, for example, are the same for either approach; therefore, the concepts and methodology noted previously for cost benefit analysis (grouped under Economic and Financial Analysis) can also be regarded as a basis for understanding and applying the cost-effectiveness approach. (See Appendix VIII, G for references.)

Cause-effect Analysis

This type of analysis for auditing focuses on substantiating hypotheses related to the failure to match the specified audit criteria, as part of the evaluation phase of the audit process.

Systematic approaches for carrying out this analysis are given in the references found at Appendix VIII, H.1-H.3, each of which was tailored to the particular type of audit objective and approach.

Some form of structured cause and effect analysis noted above is highly recommended for each audit application; see the references in Appendix VIII, H.4-H.6 for an overview of its use in the development of audit findings.

Relationship to the Audit Process in General

With respect to the audit process, the potential scope and use of the evaluation control models highlighted in this sub-section are wide ranging and significant. The impact of this class of models on selected phases and sub-phases of the audit process can be seen in Appendix 1. Coverage of all major sub-phase activity in Appendix 1 is exhaustive (100 per cent) over the range of models suggested above. Further details on the specific applications of each model or technique are referred to in the noted references in the Appendices, or in Volume III of this Handbook (Audit Guides).

CONCLUSION

This chapter has presented a compendium of analytic concepts and techniques from a wide range of diverse fields and disciplines that have much potential application for the internal auditor. Brief descriptions were given of the actual and potential interface between the technique and the audit process, as depicted by its major phases and sub-phases.

The internal auditor is encouraged to further develop and refine such models in the pursuit of more efficient and effective decision-making in the audit process.

The list of references provided in the Appendices falls into two general classes: those that can be applied by the auditor and those that will, typically, require the help of a specialist.

Given the unlimited scope of the internal auditors activities, it should not be surprising that need will arise for expertise in subject matter, and associated methods and techniques, that is not available in a typical group of "core" auditors. In these cases the employment of specialists is strongly encouraged in order that the same professional audit rigour be maintained in these areas as is currently normal for financial areas.

SELECTED PHASES IN THE AUDIT PROCESS CROSS-REFERENCED BY ANALYSIS TECHNIQUES AND BIBLIOGRAPHIC SOURCE

| | GENERAL CLASSES OF ANALYSIS TECHNIQUES | SELECTED PHASES IN THE AUDIT PROCESS | | | | | | | | | | | | | | | | | |
|------|--|--------------------------------------|---|---|---|---|--------|---|---|---|------------|---|---|---|---|--------------|---|---|--|
| | | PLANNING | | | | | REVIEW | | | | EVALUATION | | | | | VERIFICATION | | | |
| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | |
| III | FLOWCHARTS NETWORKS DESCRIPTIVE MODELLING | A | X | X | | | X | | | | | | | | | X | | | |
| | | B | X | X | | | X | | | | | | | | | X | | | |
| | | C | X | X | | | X | X | | | X | X | | | | X | | | |
| | | D | | | X | | X | | | | | | | | | X | | | |
| | | E | | | | | | X | X | | | X | X | | | | | X | |
| | | F | | | | | | | | | | | | | X | | | | |
| | | G | | | | | | | | | | | | | | | | | |
| IV | DECISION THEORY | A | X | X | X | | X | | X | | | | X | | X | X | X | X | |
| | | B | | | | | | X | | | | | | X | X | X | X | X | |
| | | C | | | | | | | | X | | | | X | X | X | | X | |
| | | D | | | | | | | | | | | | | | | | X | |
| V | MS OR THEORY | A | | | X | | X | | | | | | X | | | | X | X | |
| | | B | | | | | | X | | | | | X | | | | X | X | |
| | | C | | | | | X | | | | | | | X | | | X | X | |
| | | D | | | | | | | | | | | | | | X | | X | |
| | | E | | | | | | | | | | | | | | | X | X | |
| | | F | | | | | | | | | | | | | | | | X | |
| VI | GENERAL SYSTEMS THEORY | A | | | | | | X | | | | X | X | | | X | X | | |
| | | B | | | | | | | X | | | X | X | | | X | X | | |
| | | C | | | | | | | X | X | | X | X | | | | | | |
| | | D | | | | | | | | | | | | | X | | X | | |
| VII | ECONOMIC FINANCIAL ANALYSIS | A | | | | | | | X | | | | | | X | | X | | |
| | | B | | | | | | | X | | | | | | X | | X | | |
| | | C | | | | | | | | | | | | | X | | X | | |
| | | D | | | | | | | | | | | | | X | | X | | |
| | | E | | | | | | | | | | | | | X | | X | | |
| VIII | SAMPLING THEORY | A | X | X | X | | X | | | | | | | | | X | X | | |
| | | B | | | | | X | | | | | | | | | X | X | | |
| | | C | | | | | X | | | | | X | X | | | | | | |
| | | D | | | | | X | | X | | X | X | X | X | | | X | | |
| IX | EVALUATION CONTROL THEORY | A | X | X | X | | X | X | | | | X | X | | | X | X | | |
| | | B | X | X | | | X | | | | | | | | | X | X | | |
| | | C | | | | | | X | | | | X | X | | | X | X | | |
| | | D | | | | | | | X | | | X | X | | | X | X | | |
| | | E | | | | | | X | | | | X | X | | | X | X | | |
| | | F | | | | | | | | | | | | | | X | X | | |
| | | G | | | | | | | | X | | | | | X | X | X | | |
| | | H | | | | | | | | X | | | | X | X | X | X | | |

Legend: X : denotes applicable analytic technique by sub-phase of the audit process.
The sub-phase groupings were derived from the report: Guide to the Development and Conduct of Audit Assignments, Exposure Draft, July (1982).



: denotes sub-phases of the audit process mainly concerned with reports, presentations, working papers and similar communication requirements: i.e. where the role of analytic methods is minimal.

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CHAPTER FIVE

AUDIT EVIDENCE

INTRODUCTION

Review of audit literature indicates the centrality of the concept of evidence to the audit process. The popular text, Management Auditing - Concepts and Practice by John A. Edds, states that the ". . . selection, examination, and evaluation of evidence is the backbone of any audit because the auditor must amass the evidence necessary. . . to support the points made in the audit report."¹ R.K. Mautz and H.A. Sharaf in their much referred to audit text, The Philosophy of Auditing, support Edds' view as they state: "Auditing in its entirety is made up of two functions, both closely concerned with evidence. The first is the evidence-gathering function; the second is that of evidence evaluation."² The importance attached to the subject of audit evidence by audit researchers is consistent with the views of audit practitioners. The Standards for Internal Audit which govern internal audit practices in the federal government state that "sufficient, valid and relevant evidence should be obtained and documented to support the content of audit reports."³

While the concept of evidence is widely recognized by auditors as a key aspect of the proper conduct of audit assignments, in practice, the degree of discipline brought to evidence-gathering and evaluation duties varies considerably between auditors. The variations in practice as to what constitutes sufficient, valid and relevant evidence are often explained on the basis of differences naturally arising in the exercise of the internal auditor's professional judgment. Although auditor judgment will always represent a vital aspect of any audit, care must be taken to ensure that undue subjectivity is not substituted in areas where objective guidelines could be developed and constructively used by the internal audit community.

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 2. Mautz, R.K. and Sharaf, H.A., The Philosophy of Auditing, Evanston: American Accounting Association, 1961, p. 68.
 3. Treasury Board of Canada, Standards for Internal Audit in the Government of Canada, Office of the Comptroller General, 1982, p. 8.

The auditing standard of the Certified General Accountants Association (Canada) entitled "Auditor Judgement" indicates that there is an increasing pressure on auditors to be able to explain and defend their judgments to users of the audit report. Given that one of the key problems in auditor judgment is the determination of the nature and amount of evidence that should be accumulated, the need for objective criteria for such judgments is becoming increasingly significant.

This document seeks to aid the auditor in determining what constitutes sufficient, valid and relevant evidence and how it should be gathered. In this regard, Section One briefly explores the position of evidence in relation to other internal audit concepts to clearly establish the nature of evidence and the purposes it is meant to serve. Section Two discusses the practical aspects of gathering audit evidence, reviewing the various types of evidence available and the techniques that can be used to accumulate it. Section Three focuses on what is meant by "sufficient, valid and relevant" evidence and the factors the auditor should consider when assessing the adequacy of evidence gathered to support the contents of the audit report. Section Four identifies certain factors that should be recognized in the proper evaluation of evidence.

As a minimum, it is hoped that this structure will provide internal auditors with a clearer understanding of references made in the Standards for Internal Audit on the subject of audit evidence. More importantly, however, this document should give auditors guidelines that will enhance the degree of objectivity and rigour they bring to evidence-gathering and evaluation activities.

SECTION ONE: EVIDENCE AND ITS POSITION IN AUDIT THEORY

An understanding of the concept of audit evidence requires an understanding of its relationship to other audit concepts. To study why auditors gather evidence, we must know the nature and purpose of the audit process as a whole. A fundamental knowledge of the audit process provides auditors with the basis on which they can develop answers to such problems as: what constitutes evidence, how much evidence is enough and how should it be gathered?

This chapter, then, begins with a brief review of evidence in relation to an overall internal audit theory framework. This framework is derived from an external audit model modified to reflect the unique features of the internal audit process. A detailed comparison of the two audit theory models is provided in Appendix A. (Note: in this chapter, the term "external audit" refers to private-sector attest audits performed by public accountants.)

The Internal Audit Model

In general, internal auditing in the federal government is a function whose purpose is to arrive at certain conclusions concerning the condition⁴ of the resources, processes and results of the entity under review. Specifically, the Standards for Internal Audit expect the auditor to determine whether:

- systems, procedures and controls are adequately designed and developed, and that they are operating efficiently and effectively;
- adequate information is available for decision-making and accountability purposes;
- available information is properly utilized in the decision-making process;
- public funds and assets are adequately protected; and

4. This term, as used in the paper, is often referred to as an "assertion" in texts which describe audit theory.

- legislative, central agency and departmental directives are being complied with.⁵

Internal auditors usually do not attempt to assess directly the operations and results of the entity under review to determine whether the above conditions exist; rather the auditors evaluate the adequacy of the control framework established by management to achieve these conditions. Essentially, the control framework serves as a proxy measure for determining whether the desired conditions actually exist. Where the auditor determines that the control framework is effective, the underlying inference is that the entity under review likely achieves satisfactory operating conditions. For example, consider the auditor's task of concluding whether the level of efficiency found in a system under review is adequate. The auditor's tests of the control framework will not give a full appreciation of the system's actual efficiency but will give assurance that management is doing everything practical to ensure that desired levels of efficiency are achieved. Using tests of the control system, the auditor can conclude that there is reasonable assurance that the operations are achieving an adequate level of efficiency.

Since the adequacy of the control framework must be evaluated, a prerequisite to the conduct of the audit is the existence of a set of established criteria to be used as a basis for the auditor's evaluation. A model control framework is developed to represent the set of criteria for determining the adequacy of the actual control framework in place. As a minimum this model identifies the various objectives that should be served by the control framework and the ways in which the auditor can judge whether these objectives have been and will continue to be met.

Evidence in auditing refers to any relevant, reliable matter or facts obtainable which will assist the auditor in forming conclusions on the extent to which the above-mentioned criteria are met. Facts are obtained by the auditor primarily on the actual design, operation and effects of the control system of the entity subject to audit, including the actions and representations of those responsible for the system's operation.

5. Treasury Board of Canada, op. cit., pp. 61-62.

The Standards for Internal Audit generally require that "sufficient, valid and relevant evidence should be obtained and documented to support the content of audit reports". The Standards go on to identify two factors which should help auditors assess whether they have gathered an adequate level of evidence. Specifically, auditors are given further guidance relating to (a) the degree of correspondence they must seek when comparing evidence to the criteria established for the audit; and (b) the degree of proof or evidence required to support the auditor's conclusions. While Section Three of this document explores in detail these factors which influence decisions relating to the proper gathering of evidence, it is instructive in this overview to discuss briefly the two areas of guidance noted above.

The extent of evidence required in an audit is influenced by the fact that the auditor is not required to determine whether there is an exact correspondence between the actual control framework and the control model established for the audit.⁶ Similar to the external auditor's concern for "fairness" as opposed to mechanical exactitude in the presentation of financial results, the internal auditor seeks "adequacy" in the actual control framework, not perfection. The threshold of what constitutes a significant deficiency in the adequacy of control performance gives rise to the need for a concept of materiality for internal auditors similar in nature to the concept used by external auditors.

In terms of the degree of proof required in an audit, the Standards for Internal Audit require that the auditor conduct ". . . examinations and verifications to a reasonable extent . . .", but do not require ". . . detailed tests of all transactions".⁷ This statement reduces the auditor's responsibility to gather evidence from one where absolute or certain proof must support the auditor's comments to one where a reasonable basis for audit comments is acceptable.

To summarize this analysis of internal audit theory, the obtaining and evaluating of evidence is the essence of auditing. The types of evidence obtained depend on the nature of the criteria (and ultimately, the underlying conditions) relevant to a

6. Ibid., p. 78.

7. Ibid., p. 77.

particular audit entity. In addition, the proper evaluation of evidence requires the development of explicit criteria which serve as standards for judging the adequacy of the controls under review. Finally, auditors are not required to gather all evidence that is available to them but only an amount which provides a "reasonable basis" for reporting on the "adequacy" of systems, procedures and controls.

Elaboration on the Role of "Users" and "Established Criteria" in the Internal Audit Model

Users of Internal Audit Reports and their Influence on Audit Evidence

In this document, the term "user" refers to the primary intended recipient of the audit report and the person for whom the auditor performs the audit service. The user is to be distinguished from the "auditee" who represents the manager responsible for the operations and activities which are the subject of the auditor's examination.

In general, the primary report recipient can be readily identified. In the federal government, the internal auditor performs audits primarily for a deputy minister or a department's senior officials. Secondary users of internal audit reports would include departmental managers subordinate to those noted above and external audit or central agency review groups who may rely upon the work performed by the internal auditor.

The fact that the internal auditor reports to specific "users" is significant in that it provides the auditor with an opportunity to receive direction concerning the areas where particular audit attention should be focused. This user direction can help the auditor in decisions relating to: the relative emphasis to be placed on the various conditions that the auditor will conclude upon; the criteria for evaluating the entity under review; what constitutes a material deficiency; and ultimately, the nature and extent of evidence that should be accumulated by the auditor. The user can often provide the auditor with valuable information relating to the types of risk which affect an auditee's operations. In the planning of audit coverage, therefore, the auditor is well advised to consider this source of information and determine how evidence-gathering strategies should be adjusted. We will return to this point in Section Three.

The opportunity for the internal auditor to receive direction from users is not found in all types of audit engagements. For example, in external private-sector auditing such user direction is essentially non-existent; it is through the external auditor's professional associations that guidelines and standards are developed to aid in determining answers to problems relating to such things as the types of criteria necessary and extent of evidence required for assignments.

In summary, internal auditors should ensure that users are approached to offer advice concerning:

- the relative emphasis to be placed on the various auditee conditions subject to audit;
- the nature of the criteria to be used to evaluate the entity under review; and
- what constitutes a material deficiency.

This information should influence the auditor's judgment when deciding upon the nature and extent of evidence required on any particular assignment.

The Nature of Established Criteria for Internal Audits and its Effect on Evidence-gathering Activities

As noted, the internal auditor forms various conclusions concerning the degree of correspondence between the evidence gathered on the auditee and the established criteria. In external auditing, the established criteria are widely accepted by audit practitioners and codified by the Canadian Institute of Chartered Accountants in the form of generally accepted accounting principles. In internal auditing, criteria used to judge the adequacy of controls have not been codified. To a large extent, these criteria, at present, are chosen on a judgmental basis by the internal auditor.

While auditor judgment is necessary in the determination of criteria, internal auditors should not unilaterally establish the criteria that are to be used on any given assignment. Instead, auditors should seek input from users and auditees before

determining criteria for the audit assignment and obtain further support through reference to authoritative sources (e.g. legislation, central agency and department policies) where appropriate and feasible.

Given this perspective on the nature of internal audit criteria, the significant aspect to note is the degree of latitude allowed in their determination. In external auditing, criteria are relatively fixed while in internal auditing considerable flexibility may be allowed. Indeed, it may be that internal audit criteria will never reach the status of "generally accepted" but perhaps will require on-going determination on a situational basis.

The nature of the established criteria in the internal audit model gives rise to the following effects:

- The internal auditor should be prepared to change established criteria if evidence gathered reveals that the basis for the audit evaluation is inappropriate. It is unlikely that external audit criteria would change during an audit in that financial reporting is conducted within fairly narrow boundaries of acceptable practice. It is quite plausible, however, that the internal auditor's criteria could be found deficient as the audit progresses and evidence is reviewed.
- The internal auditor should carefully consider the skills required to conduct the audit given the nature of the criteria developed for the assignment. In external audits, the nature of established criteria relates to the subject matter of "accounting principles". This area is one in which the auditor has been specifically trained. In certain cases in the internal audit context, the nature of the established criteria may require specialized skills for recognizing appropriate evidence and related techniques for its accumulation.

Summary

Evidence refers to facts obtained by auditors which assist them in forming conclusions about the adequacy of the auditee's control framework and ultimately about the adequacy of the underlying condition of the resources, processes and

results of the entity under review. The recognition of the types of evidence relevant to a particular audit depends upon the auditor's objectives and the nature of the criteria established for the audited entity. Proper accumulation and use of evidence therefore depends upon an appropriate understanding of the ultimate conclusions an auditor wishes to make and the auditor's use of satisfactory evaluative criteria.

To ensure that audit reports remain relevant to users, auditors should recognize the importance of seeking user guidance on the relative significance of various auditee conditions that should be concluded upon and the types of criteria they consider appropriate to particular audits. Such user influence will affect the relative importance of various types of evidence and the amount collected.

Auditors do not seek exact correspondence between auditee performance and established criteria. In addition, auditors are not required to ensure that their conclusions are supported by absolute proof; rather a reasonable basis is acceptable. These guidelines to internal audit practice reduce the amount of evidence that must be accumulated but create problems for auditors in terms of establishing the lower limit of audit evidence that will satisfactorily support the contents of their report. The problem of establishing the minimum level of evidence required to provide convincing audit report conclusions and recommendations will be further explored in Section Three.

SECTION TWO: TYPES OF EVIDENCE AND METHODS BY WHICH IT IS GATHERED

To perform properly the evidence-gathering and evaluation functions, an auditor must understand:

- the various types of evidence, how they differ in kind and reliability and the various strategies that can be employed to gather them;
- the factors which help determine what constitutes sufficient, valid and relevant evidence necessary to support the contents of the auditor's report; and
- the personal qualities that an auditor should maintain and develop to ensure that observational errors and bias do not jeopardize the evidence-gathering process.

In this section, the discussion focuses on the types of evidence available to auditors followed by a review of the various evidence-gathering techniques that auditors can employ. An understanding of the full range of the types of evidence available and techniques for its extraction will help give the auditor flexibility in developing evidence-gathering strategies. Such knowledge will also help reduce the risk of undue auditor reliance on any particular kind of evidence or evidence-gathering technique. Section Three will then turn to the factors which help determine what constitutes sufficient, valid and relevant evidence. Section Four will review the personal qualities auditors should strive to maintain to ensure that evidence is properly evaluated.

Types of Evidence

In brief, evidence is anything that contributes to the establishment of proof. In auditing, evidence includes those things which help the auditor form an opinion or belief about the actual conditions which exist in the area under review. In the following, evidence is classified from three different perspectives: by form, by source and by type of proof provided.

Classification of Evidence by Form

The following list identifies six types of audit evidence according to the criterion "what things give proof":

- Physical presence of objects
- Observed actions of auditee personnel
- Oral or written statements and representations
- Information contained in documents
- Evidence from reperformance
- Mutual consistency between various pieces of data.

Physical presence of objects

The physical presence of an object provides proof used to verify the existence of an object, assess its qualities or measure the quantity of it on hand.

Observed actions of auditee personnel

Observed actions represent proof generated by the auditor. This type of evidence is typically used to verify the performance of an activity or procedure and whether it is being performed as intended. Observed actions provide important overall knowledge of auditee systems and controls and can help the auditor identify suspicious circumstances.

Oral or written statements and representations

Also called testimonial evidence, this form of evidence represents information received from others acting as expert witnesses on matters relating to inquiries made by the auditors. Substantial amounts of testimonial evidence are gathered in internal auditing from personal interviews or requests for written statements and letters of confirmation. This type of evidence can be used for describing most aspects of the actual operations under review.

Information contained in documents

This form of evidence is proof derived from various written records such as procedural manuals, accounting records, contracts and documents of all types. Records are examined to verify the occurrence of transactions or events through examination of source documents. Records can also provide a description of the intended design of the system under review. Finally, recorded results can be analyzed as a means of determining the effectiveness of the controls of the operation under review.

Evidence from reperformance

The concurrence of the findings of reperfomed actions or calculations with original findings is typically used to verify the accuracy of measurements or valuations. Checking prices, extensions or other computations are examples of procedures used to generate this type of proof. Reperformance of the additions of lists also helps check the existence and completeness of listed items, since out-of-balance conditions could indicate accidental inclusions, double counting or omissions. Reperformance can demonstrate whether the original performance of a control was effective. An example would be the repetition of a payroll calculation which a second employee had initialled for checking.

Mutual consistency between various pieces of data

It can be argued that mutual consistency between various pieces of evidence does not in itself represent a new form of evidence but has merely a confirmatory effect. Increments of audit evidence pointing toward the same conclusion have a confirmatory effect and thus a joint degree of persuasiveness higher than that which any individual increment possesses in isolation. The reason, however, for treating mutual consistency (or inconsistency) as a type of evidence in its own right is that much important audit work is devoted exclusively to searching for it. Analytical review procedures, for example, represent systematic study and comparison of related figures, trends and ratios in order to identify their mutual consistency or inconsistency.

Reliability Considerations

In general, the intrinsic form of evidence will influence its trustworthiness in supporting audit report conclusions. Although one must determine first the reliability of the source of various pieces of evidence, secondary consideration of the form (physical vs. documentary vs. oral) will give additional means for assessing the trustworthiness of the proof provided. Reliability determination is further discussed in the following and in Section Three.

Classification of Evidence by Source

Audit evidence can be classified according to the source from which it is derived, providing the auditor with an additional perspective for looking at the nature of evidence. This should enhance the auditor's understanding of what evidence is available and thereby increase the auditor's flexibility when determining evidence-gathering strategies. Reference to the source of particular pieces of evidence is also a useful way auditors can assess the reliability of proof obtained.

There are four major sources of evidence which will be considered:

- personal knowledge of the auditor
- external evidence
- internal evidence
- overlapping evidence

Personal Knowledge of the Auditor

Direct personal knowledge is normally derived by the auditor through physical examination and observation of activities. This type of evidence tends to be the most reliable, provided that the auditor can minimize the risk of observational errors (refer to Section Four of this chapter).

External evidence

This represents evidence obtained from third parties who are organizationally independent from the auditee. There are, of course, degrees of organizational independence such as the varying independence of third parties who are within the same departments as the auditee and those who are not.

The reliability of this type of evidence depends on the auditor's evaluation of its trustworthiness, competence and objectivity. Where these factors do not prove problematic, external evidence generally is favoured as being more persuasive than evidence created within the auditee organization.

Internal evidence

This represents evidence created by the auditee organization. On any audit, this is by far the most prevalent and economical type of evidence to obtain. It also tends to be the least reliable (with oral evidence being less reliable than documentary) of the various sources of evidence.

Reliability depends largely on the auditor's determination of the competence and trustworthiness of the auditee providing the information.

Overlapping evidence

This is evidence which is derived from the mutual consistency of different pieces of information pertaining to a control assertion.

Reliability of evidence from this source depends on the degree of consistency found between separate pieces of information, the persuasiveness of the consistency and the auditor's skill in assessing the relationship between separate pieces of evidence.

Each of the forms of evidence discussed can be related to their source. Table 1 illustrates this and provides examples of each form of evidence.

Table 1

Forms of Evidence Classified by Source⁸

| Source and Form of Evidence | Example of Evidence |
|--|---|
| A. Direct Personal Knowledge | |
| 1. Physical evidence | Actual capital assets or materiel available for inspection. |
| 2. Concurrence of reperformance | Concurrence of pricing extensions done by the auditor with those originally recorded on contractual agreements or invoices. |
| 3. Observed actions of auditee personnel | Performance of security routines by auditee personnel. |
| B. External Evidence | |
| 4. Statements and representations by third parties | Personal interview of user group personnel as to satisfaction with auditee services. |
| 5. External documentary evidence (if received directly from third parties) | Studies or reports prepared by subject matter specialists. |
| C. Internal Evidence | |
| 6. Accounting records and reports | FINCON reports. |
| 7. Internal documentary evidence (obtained from within the auditee organization) | Internal management information system reports. |
| 8. Statements and representations by management and employees | Explanations of auditee procedures. |
| D. Overlapping Evidence | |
| 9. Consistency with other evidence | Analysis of trends such as customer complaints and correlation with other evidence such as the known condition of the auditee's control system. |

8. Anderson, Rodney J., The External Audit 1 - Concepts and Techniques, Toronto 1977, p. 254.

Classification of Evidence by Type of Proof Provided

Recognition that evidence can provide different types of proof is useful to auditors when designing their evidence-gathering strategies. Searching for pieces of evidence which provide different types of proof enhance the overall persuasiveness of the auditor's conclusions. In this part, type of proof provided is looked at from two perspectives. First, does the evidence gathered provide positive or negative proof? Second, does the evidence gathered represent primary, corroborating or contradictory proof?

Positive versus negative

Evidence which provides positive proof is evidence which directly supports a proposition being verified. For example, if an auditor is attempting to verify that a control is adequate, evidence which generates positive proof provides direct assurance that the control is indeed adequate.

Evidence which provides negative proof is actually the absence of evidence, after a reasonable search for it, which contradicts the proposition being verified. For example, in verifying the adequacy of a control, the auditor would first determine the types of conditions that would likely exist if the control was inadequate. The auditor would then look for the existence of such conditions. Where the auditor failed to discover conditions suggesting control inadequacy then negative proof has been generated. This proof provides some evidence that the control is actually operating adequately.

Evidence which provides positive proof is inherently more reliable than evidence generating negative proof. To find that a certain condition exists is more reassuring than not finding something wrong. Tests to establish the effectiveness of controls however, often employ verification procedures involving a search for negative proof. To search for undesirable effects is sometimes easier than proving that a control is indeed operating effectively.

Primary, corroborating and contradictory

Evidence may be classified as to whether it is primary, corroborating or contradictory. Primary evidence, as the name suggests, is the evidence upon which the auditor places primary reliance in establishing the proof of audit report conclusions.

Depending upon how persuasive primary evidence is, there may or may not be a need for additional evidence. Where additional evidence is gathered it may be considered corroborating or contradictory. Corroborating evidence supports the type of proof provided by the primary evidence while contradictory evidence refutes it. Where additional evidence gathered is contradictory, it will usually require the auditor to extend audit testing procedures to confirm or refute the apparent contradiction.

Summary

Three ways of classifying evidence have been presented. Recognition of the various forms, sources and proofs of evidence should enhance the flexibility of the auditor's evidence gathering strategies and reduce the risk of undue reliance on any one particular type.

Methods of Gathering Evidence

The quality of audit results is necessarily dependent on the adequacy of the methods used for gathering evidence. In current internal audit practice much reliance is being placed on interview inquiry as a means of gathering evidence. In many cases, this practice is probably justified because of the limited usefulness of other techniques. Nevertheless, internal auditors must be wary of habitual reliance on certain techniques and ensure that for each assignment the full spectrum of evidence-gathering methods is considered.

In this part, there is a consideration of the techniques generally available to the auditor. These are presented schematically in Table 2 in relation to the various sources and forms of audit evidence previously discussed.

Table 2

Audit Evidence and Audit Techniques⁹

| Source of Audit Evidence | Form of Audit Evidence | Most Closely Related Audit Technique |
|---------------------------------|--|--|
| A. Direct Personal Knowledge | 1. Physical evidence | 1. Physical examination |
| | 2. Concurrence of reperformance | 2. Reperformance |
| | 3. Observed actions of auditee personnel | 3. Observation |
| B. External Evidence | 4. Statements and representations by third parties | 4. Inquiry |
| | 5. External documentary evidence (received directly from third parties) | 5. Scrutiny, vouching, analysis |
| C. Internal Evidence | 6. Accounting records and reports | 6. Scrutiny, vouching, analysis |
| | 7. Internal documentary evidence | 7. Scrutiny, vouching, analysis |
| | 8. Statements and representations by management and employees | 8. Inquiry |
| D. Overlapping Evidence | 9. Consistency with other evidence | 9. Correlation with related information |

9. Ibid., p. 255.

Physical Examination

Physical examination generally involves the measurement of the quantity of an asset or assessment of its quality as compared to a predetermined standard. The technique can also search for negative proof such as a review for evidence of shortages or damage in assets.

Physical examination is often used to test the effectiveness of controls particularly for those controls relating to the security of physical quantities or qualities of tangible assets. Evidence is gathered on items having a tangible presence. Materiel, for example, is often a subject for this form of audit test.

The reliability of evidence obtained from this method will depend on whether specialized skills are required of the auditor to avoid observational error.

Observation

The elements of observation include:

- identification of a specific activity to be observed;
- observation of its performance;
- comparison of observed behaviour against criteria; and
- evaluation and conclusion.

Normally, observation serves objectives such as the verification of the performance of various control procedures. To the extent that the auditor may observe suspicious activities in the entity under review, the test may be thought to also test the effectiveness of control procedures.

Usually, observation is important where it can be employed economically. Again, the reliability of evidence derived from this method depends on whether specialized skills are required of the auditor given the complexity of the activities under review.

Inquiry

Oral Inquiry - Auditee

This type of evidence is by far the most easily obtainable but it tends to be the least reliable. In general, all oral auditee representations relating to "material" items must be corroborated with other evidence.

Inquiry can be used in several ways:

- as a means of determining the nature of the control system under review;
- to obtain explanations of unusual items discovered in the course of gathering other evidence; and
- to elicit information otherwise not available.

The reliability of oral inquiry depends upon the objectivity and knowledge of the employee providing the information. In addition, the competence of the inquirer (knowledge, tact, objectivity and judgment) is crucial to the reliability of this technique.

Written Inquiry - Auditee

Typically, this technique is used in the internal audit context at the report writing stage when the auditee is requested to comment in writing on the factual validity of audit report representations.

It is useful to ensure that such evidence is obtained:

- to act as a final check against auditor interpretation of the facts;
- to ensure that the auditee has comprehended the auditor's conclusions;
and

- to help emphasize the auditee's responsibility to take action on the findings.

Inquiry - Third Parties

In this document, third parties include all persons outside of the auditee organization. This may include:

- officers and employees of the same department but outside the auditee unit (provided such persons are truly independent of the auditee - see below);
- officers and employees of other departments; and
- specialists not included in the above noted groups.

Evidence from third parties is generally considered more reliable than auditee-generated evidence. Reliability, however, is dependent on the trustworthiness, competence and independence of the third party and the directness and effectiveness of the auditor's communication. Internal auditors must be particularly wary of possible competing interests between auditees and third parties as such a situation would likely diminish the usefulness of third-party inquiry.

Inquiry directed towards user groups of auditee services or specialists are often quite useful ways of gathering corroborating evidence. In using specialists, however, the auditor should:

- establish the specialist's competence through reference to qualification and reputation;
- ensure that communication is effective to the specialist through the use of a clear statement of purpose and requested work;
- ensure that the specialist states assumptions and methods; and

- auditor reviews specialist work once complete and tests it for reasonableness.

Vouching/Scrutiny

Vouching is the verification of a given action through examination of related source documents that provide the needed proof. This technique can be used to compare the action under consideration with documented facts and to investigate any differences.

Scrutiny involves a searching review of data to locate significant items requiring further investigation. Generally, this technique is used to provide assurance that controls are operating effectively as supported by the absence of suspicious circumstances which would suggest possible deficiencies. The reliability of this type of evidence is largely dependent on the skill and experience of the observer.

Analysis

In this document, analytical review relates to the analysis of the system under control so as to obtain evidence as to the effectiveness of the control system or as a means of identifying the causes and effects of any control deficiencies.

Generally, analytical review involves the comparison of normal trends in the entity under review with expected results. The relationships arising from this comparison must be reasonably explainable, otherwise there is likely a need to gather additional evidence to clarify the illogical or unexpected relationships which seem to exist.

Correlation

This technique looks for the mutual consistency between different pieces of evidence. It is used to provide corroborating evidence which increases the persuasiveness of the auditor's proof.

Summary

In Section Two, we reviewed the various types of evidence available to the internal auditor and the techniques that can be employed when gathering it. The focus of the discussion has been to encourage auditors to consider the full range of evidence that may be brought to bear on any audit assignment. It is hoped that the risk of undue reliance on certain kinds of evidence or evidence-gathering techniques will be reduced as a result of this discussion.

SECTION THREE: SUFFICIENT, VALID AND RELEVANT EVIDENCE

In this section of the chapter, attention is focused on the factors which help determine what constitutes sufficient, valid and relevant evidence necessary to support the contents of the auditor's report.

The Importance of Objectively Determining Sufficient, Valid and Relevant Evidence

As noted in Section One, the Standards for Internal Audit require that auditors "...conduct examinations and verifications to a reasonable extent..." but they are not required to perform "...detailed audits of all transactions".¹⁰ Because auditors are not required to gather all evidence available to them, the problem arises as to what actually constitutes sufficient, valid and relevant evidence which will adequately support the contents of audit reports.

General rules or criteria by which the auditor can arrive at an assessment as to the adequacy of the evidence gathered have not been codified. At present, conclusions concerning whether the evidence gathered is sufficient, valid and relevant are typically arrived at through the exercise of the auditor's professional judgment. While it is recognized that the internal auditor's judgment will always play a central role in such decisions, there are several compelling reasons for ensuring that auditors attempt to enhance the degree of objectivity brought to evidence assessments where possible.

First, where too much subjectivity is allowed in determining what constitutes sufficient, valid and relevant evidence, there is a danger that different auditors will choose varying types and amounts of evidence despite the audit being conducted under essentially the same circumstances. As a result, the information value of an audit report may also be expected to vary given the differing levels of detail upon which its contents are based.

10. Treasury Board of Canada, op. cit., p. 77.

A second reason for ensuring objectivity in evidence-gathering decisions is derived from the interest users are showing in the internal audit function. As the audit function matures in the federal government, more use is being made of audit reports. It is not unrealistic to expect auditors to disclose to various users the evidence supporting the contents of their report and the basis upon which the auditor determined the adequacy of the level of evidence gathered. Groups such as departmental audit committees, central agency review groups and the Auditor General of Canada all may have a need to rely on the internal auditor's work. It is quite proper that they establish a basis for this reliance by reviewing the evidence-gathering decisions made by the internal auditor. With an objective basis for determining such decisions, the internal auditor may provide the rationale from which a wider reliance on the internal audit function can take place.

A final reason for ensuring enhanced objectivity is derived from the existence of increasing resource constraints in the federal government. While there is increasing use of audit reports, resource constraints require that auditors carefully consider what level of effort can practically be applied to the gathering of evidence to support audit conclusions. An explicit awareness of the factors associated with the trade-off between higher quality audit results and resource limitations may improve the auditor's judgment as to what type and level of audit effort will be most beneficial given resource constraints.

To enhance the objectivity of evidence-gathering activities the following section amplifies what is meant by sufficient, valid and relevant evidence and the factors which should influence an auditor's decision as to when an adequate amount of evidence has been gathered.

Sufficiency, Validity and Relevance of Evidence - Definitions

The concepts of sufficiency, validity and relevance are interrelated. As used in the Standards for Internal Audit, sufficiency is a measure of the quantity of audit evidence obtained and validity and relevance are measures of its quality. The decision as to whether a sufficient quantity of evidence has been obtained will be influenced by its quality.

To be sufficient, evidence must be persuasive to an extent which justifies the contents of the audit report. Sufficiency is achieved when both the auditor and the recipient of the audit report are satisfactorily persuaded that the auditor's findings and conclusions are appropriate. This normally requires that the amount of evidence gathered is sufficient to also convince the auditee, but ultimately the auditor must be most concerned about persuading the user of the audit report who has control over the implementation of the audit recommendations.


Validity refers to the soundness or credibility of evidence in supporting the auditor's conclusions concerning the nature of the entity under review. Generally, the more reliable the source and form of audit evidence, the more valid it will be. The generalizations about the reliability associated with different forms of evidence from various sources was discussed in Section Two of this chapter. Table 3 is an illustration of a reliability ranking scheme that contains the points made in Section Two and that auditors have found useful over time. While it is important to recognize that there will always be exceptions to any generalization, this ranking scheme should help auditors assess the probable reliability of various pieces of evidence.

Relevance means the degree to which audit evidence relates to the auditor's objectives. Audit objectives can be divided into compliance and substantive objectives. Compliance objectives are concerned with assessing the adequacy of the design and operation of the essential controls of the entity under review. Specifically, audit evidence derived from compliance procedures is related to verifying: (a) the existence and completeness of essential controls, (b) whether they are operating as designed, and (c) whether they are effective. Substantive objectives are concerned with substantiating significant deficiencies and major inefficiencies in the design and operation of essential controls, to assess their effect and to identify their causes.

Clearly the auditor must seek evidence for each of these individual objectives. Obtaining the most persuasive evidence as to the existence of a control will not compensate for failure to establish its effectiveness. Audit evidence must be relevant to the specific audit objective it serves and each specific objective must be ultimately

Table 3

Reliability of Evidence given its Source¹¹

| | Diminishing Degree of <u>Reliability</u> |
|---|--|
| ● Direct personal knowledge obtained by the auditor through direct observation, physical examination, recomputation, etc. |  |
| ● Evidence obtained through confirmation with, or inquiry of, competent, trustworthy and independent third parties. | |
| ● Documentary evidence obtained through the vouching of records produced external to the auditee (e.g. specialist reports, reviews). | |
| ● Documents developed, under satisfactory conditions of internal control, by auditee. | |
| ● Representations of auditee organization; sub-divide representations according to the following categories ranked in terms of reliability: | |
| - representations of trusted senior officials; | |
| - representations from officials with a relatively more objective point of view of specific matters; | |
| - representation can be corroborated by representations of a number of other officials. | |

Note: This chart is based on the assumptions that, in general, direct personal knowledge is more reliable than indirect evidence and external evidence is more reliable than internal evidence.

11. Anderson, op. cit., p. 252.

covered. It is instructive to consider the extent of audit evidence that has been gathered for each audit objective. Because evidence concerning control design and operation may be more prevalent or more easily obtained than evidence relating to the effectiveness of its operation, there may be a tendency within certain audits performed to focus disproportionately upon control processes without due consideration of the results being achieved by the operation of those controls. Without a balanced coverage of each audit objective, however, the overall usefulness of the audit is greatly diminished.

With these meanings for sufficient, valid and relevant evidence in mind, the next part indicates how auditors may test for those attributes.

Testing for Relevance, Validity and Sufficiency

The collection of data on auditee activities occurs during all phases of the audit. Beginning in the planning phase, data relating to the auditee are collected in stages. Initially, a limited amount of data is gathered on each area subject to review and assessed for relevance, validity and sufficiency given defined audit objectives. Where data gathered are insufficient to allow the accomplishment of audit objectives, the auditor is generally obliged to gather additional information. The gathering of incremental information, however, is only done where the benefits (in terms of audit results) exceed the costs associated with its collection.

The following represent guidelines which can be used to test collected data as to whether relevant, valid and sufficient evidence has been obtained.

Relevance

Tests

Determine whether the data gathered relate to:

- the activities included within the defined scope of the audit;

- either a compliance or substantive verification objective (refer to the definitions previously provided in this section);
- a material concern.

Comments

Where pieces of data gathered are proven relevant, they then become useful to the auditor as evidence. In this context, data relate to any facts or matter available to the auditor. Evidence is distinguishable from data in that it provides facts or matter which are relevant to audit objectives and which will assist auditors in forming their conclusions about the entity under review.

In addition to considering relevance in absolute terms, the auditor should recognize that there exists degrees of relevance depending on the directness of the relationship between the evidence and the auditor's objectives. If the relevance of a given piece of evidence is extremely low, it is usually more economical to examine some alternative, more directly relevant evidence than to spend time gathering and evaluating evidence of indirect significance.

Validity

Tests

Determine the soundness, trustworthiness or defensibility of the evidence gathered by assessing the reliability of:

- the source of the evidence gathered (personal knowledge, external, internal, overlapping);
- the intrinsic nature of the evidence (physical evidence vs. documentary evidence vs. testimonial evidence, etc.)
- the method used to gather the evidence (physical examination vs. inquiry vs. analysis, etc.)

Comment

As noted in the comments for relevance, the less reliable a given piece of evidence is, the more likely it will be uneconomical to collect it.

Sufficiency

Tests

Determine whether the evidence gathered is persuasive to an extent which justifies the expression of an audit conclusion relating to the matters subject to the auditor's examination.

Comments

In Section One, we noted that auditors are not required to obtain absolute proof in the support of their conclusions. The test for sufficiency of evidence gathered derives from the auditors requirement to conduct "...examinations and verifications to a reasonable extent."¹² A criterion which may help serve the auditor in evaluating whether sufficient evidence has been gathered may be stated as:

- a sufficient amount of evidence has been gathered when it satisfies the "degree of confidence" an auditor and the user of the audit report wish to have in relation to audit findings and conclusions.

Where the evidence gathered does not meet sufficiency requirements the auditor is faced with the decision as to whether or not additional information should be gathered. The auditor must decide whether the cost of additional information gathering is warranted given the benefits associated with the particular audit objective subject to verification.

12. Treasury Board of Canada, op. cit., p. 77.

Summary

The above tests have been suggested as a means by which auditors can test pieces of data gathered as to whether they constitute sufficient, valid and relevant evidence. There are four particularly problematical aspects to the tests noted above. First, in tests for relevance, an auditor must have a method for determining the degree of relevance and what constitutes a material concern. Second, in tests of validity, the auditor must weigh the credibility or reliability of the evidence. Third, in tests for sufficiency, the auditor must understand how to assess whether a satisfactory "degree of confidence" has been achieved in relation to the audit conclusions. Finally, the auditor throughout the evidence-gathering process must be aware of the implicit cost/benefit relationship that exists. More evidence improves the clarity and persuasiveness of the auditor's conclusions but each increment in the data gathered is only obtained at a cost. The balance of Section Three will provide guidance to auditors on each of these areas.

Factors Influencing the Assessment of Sufficient, Valid and Relevant Evidence

By way of introduction, Figure 1 illustrates schematically the factors and relationships covered in detail in the balance of Section Three. It is suggested that the reader refer back to this overview as each factor is discussed in turn.

Materiality

The concept of materiality in auditing was first derived by external financial attest auditors. In such audits, it is unnecessary for the auditor to ensure that absolute accuracy is present in the reporting of financial results. Such accuracy is neither attainable given the nature of the financial reporting process nor justifiable given the needs of users of financial statements. As long as a "reasonable" level of accuracy is achieved, the auditor should be free to express the opinion that the financial statements are fairly presented. This recognition of a threshold of accuracy below which it is unnecessary and undesirable to gather evidence is embodied in the concept of materiality.

In the context of external auditing, materiality is defined as "...the limit of acceptable error or omission above which distortions in a set of financial statements... are sufficient as to destroy the fairness of presentation or misinform and misdirect the reader...".¹³

While the concept of materiality is generally accepted in principle by external auditors, its objective application to actual audit decisions has been problematic. Due to the impracticality of communicating directly with users, external auditors exercise their professional judgment to determine the dollar value limit of errors which they consider to be acceptable.

The principle behind materiality is as relevant to the internal auditor as it is to the external auditor. In short, the internal auditor does not expect perfection and infallibility in the design and operation of policies, procedures and controls but seeks a condition of adequacy. The term adequate implies that certain errors or deviations in the design and operation of auditee systems can be tolerated if they are below a particular threshold level of error size or frequency. The question of what constitutes an "adequate" policy, procedure or control then, involves the establishment of internal audit materiality guidelines.

In internal auditing "...an item would be considered material if an error in it (or its complete omission) would cause prudent, intelligent information users to change decisions that they might otherwise make on the basis of information provided by and about the auditee."¹⁴ According to this definition, internal audit concerns go beyond an interest in the strictly economic aspects of items under review. As a general rule, a control which relates to an item which is of material concern to the user of the audit report should be included within the scope of an auditor's examination.

13. Edds, op. cit., p. 144.

14. Anderson, op. cit., p. 127.

FACTORS INFLUENCING THE ASSESSMENT OF SUFFICIENT,
VALID AND RELEVANT EVIDENCE¹⁵

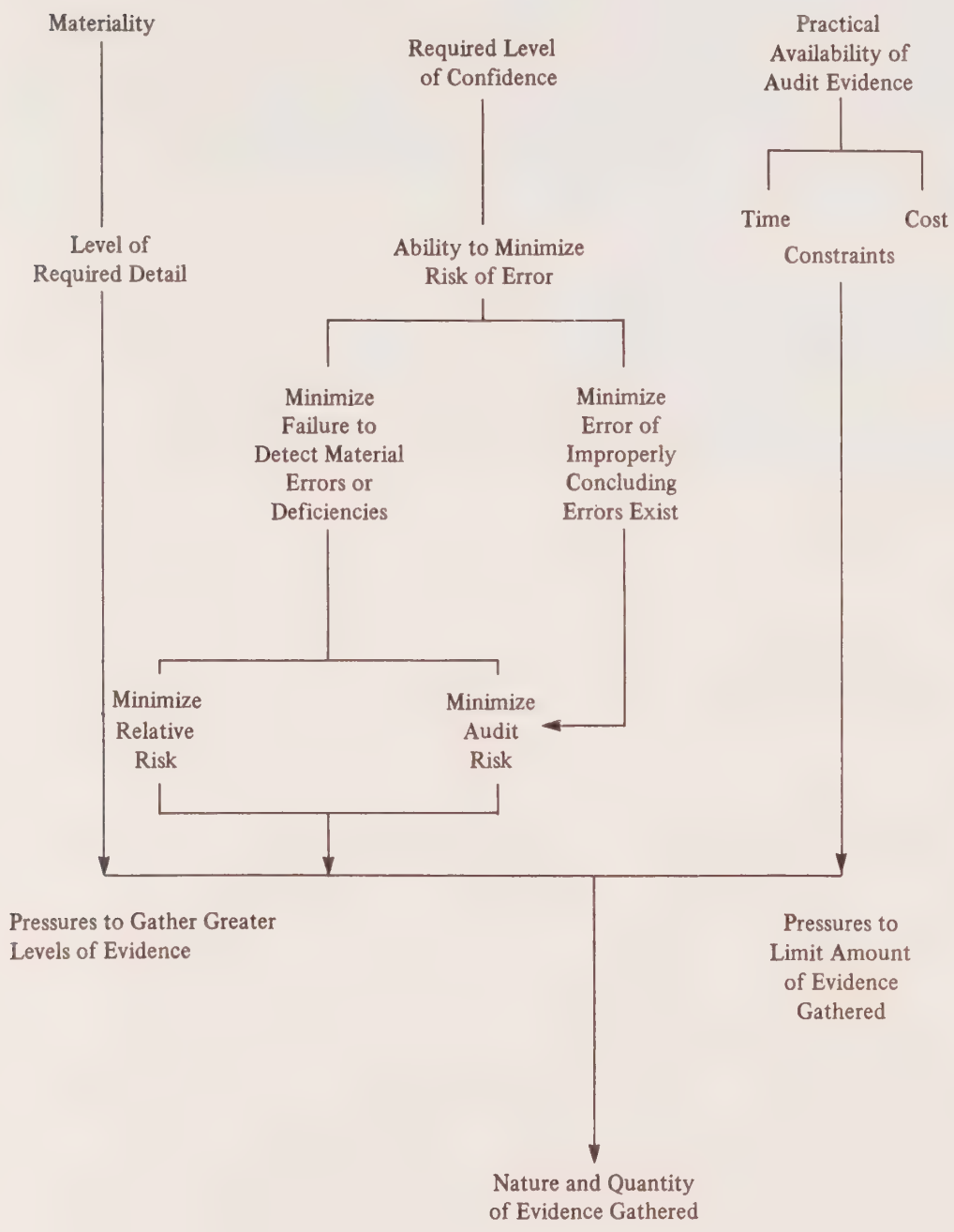


Figure 1

15. Ibid, p. 127.

The practical problem for internal auditors is to determine what errors would significantly influence the decision-making process of users should they be disclosed. Failure to establish a proper materiality limit will result in the gathering of audit evidence and the reporting of audit results at an inappropriate level of detail. A threshold limit which is set at too high a level of detail will result in audit report comments which are too general to be of significant use to the reader of the audit report. Threshold limits which are too low can result in "over-auditing" and the cluttering up of audit reports with information at an overly precise level of detail.

Internal auditors, like external auditors, must use their professional judgment when establishing the level of detail covered by their review. Table 4 lists a number of factors the auditor may wish to consider when determining which items in the system under review constitute material ones and consequently require audit evaluation of their related controls.

Table 4

Materiality Guidelines

The following represent factors the auditor should consider in determining whether items under review are material. The auditor, with appropriate input from users, should review items in terms of whether they involve:

- known or probable management issues or concerns;
- areas of particular on-going concern identified in previous audits;
- questions of non-compliance with financial regulations, fraud or other irregularities;
- potential areas of uneconomical or inefficient operations;
- uncertainty concerning the entity's knowledge of the effectiveness of its programs and deficiencies in the entity's procedures to evaluate effectiveness;
- a program or activity of particular interest because of its nature or relative size, and its importance or impact;
- significant new or expanded programs or activities;
- unusual program management characteristics, such as restrictions or freedoms in carrying out functions; and
- financial, human and physical resources of particular interest because of their nature and importance.

It is likely that where an item involves at least one of these factors, it will be "material" to the user of the audit report. Evidence-gathering strategies should be established so that the controls relating to all material items are evaluated.

One can identify an obvious parallel between the factors an auditor considers when determining what constitutes a material item and the factors considered when an auditor selects audit assignment units in the audit planning process. In both cases the auditor's interest is to ensure that audit results focus on items of significance to users of the audit report. The only major difference in the auditor's planning and materiality decisions is one of scale. A materiality limit represents the dividing line between items of significance and insignificance. Audit assignment units, though also chosen on the basis of significance to audit report users, involve a higher level of abstraction and will include therefore, a number of individually material items (refer to Volume I, Chapter 3 for a detailed discussion of the auditor program planning process).

Internal auditors have one particular advantage over external auditors when it comes to establishing materiality limits. The users of internal audit reports are identifiable persons who can be asked to provide input concerning their views on what constitutes a material item.

We have noted that the audit process involves essentially the collection of evidence in order to support the contents of the audit report. In deciding which controls to investigate and how much evidence to collect, the auditor must consider the "materiality" of the items subject to control. A matter should be judged material if knowledge of errors in it would likely influence the user of the audit report to alter decisions otherwise made on the basis of information provided by and about the auditee. To summarize, an internal auditor should:

- ask users of audit reports, where practical, to provide input concerning what constitutes a material matter; and
- make explicit on all assignments, statements as to which items constitute material matters, which items are immaterial and the basis for such judgments.

Required Level of Confidence

Beyond materiality considerations, the amount and type of evidence gathered by auditors should also depend on the degree of confidence they wish to have in the validity of audit conclusions given the needs of the users of the audit report. In auditing, 100 per cent certainty is not possible, and confidence is used to represent the degree of certainty an auditor has that an error or omission has not been made in arriving at audit report conclusions.

Absolute certainty in an audit report is not strived for because:

- audit evidence is rarely conclusive in the first place and therefore absolute certainty may be unattainable; and
- audit testing must be limited to make the activity economically justifiable.

In this part, the means by which auditors can assess and influence their level of confidence about the validity of audit report conclusions is discussed.

Types of Errors Auditors Can Make

The question of whether a reasonable level of confidence in the validity of audit reports has been obtained, can be examined in terms of the complement of such confidence: the risk that the auditor's conclusions are in error.

Auditors can make two types of errors in the contents of their audit reports. They can:

- conclude that no material control deficiencies exist in the entity under review when, in fact, such deficiencies exist; or
- conclude that material control deficiencies exist in the entity under review when, in fact, such deficiencies do not exist.

Concluding that no material control deficiencies exist when, in fact, they do, is a much more likely type of error auditors can make. In general, it is normal practice that auditors further substantiate the existence, causes and effects of any material deficiency which is detected. Such further exploration of identified weaknesses, along with the auditee challenge process inherent in the conduct of an audit, will likely minimize the significance of the risk of the auditor wrongly concluding that errors exist when, in fact, they don't. As such, the following discussion focuses upon the means by which the risk of undetected control deficiencies can be assessed by the auditor and minimized.

Minimizing the Likelihood of Undetected Control Deficiencies

In general, the internal auditor's method of minimizing the likelihood of undetected control deficiencies involves three steps. First, the auditor studies the auditee's operations in terms of the existence of conditions that will make effective control inherently difficult to achieve. Table 5 identifies a number of factors which are potentially significant in assessing control deficiencies. Review of these factors in qualitative terms will give the auditor a rough measure of the inherent risk of control ineffectiveness.

As the second step in minimizing undetected control deficiencies, the auditor should assess management's actions to reduce the likelihood of control problems. In this instance, the auditor is generally interested in management's awareness of the factors which could cause control problems and what steps they have taken to ensure that such problems do not occur.

The risk that controls will be ineffective given the inherent nature of the entity under review and management's efforts to reduce control deficiencies is termed "relative risk" in this document. The significance of relative risk is that its assessment by the auditor is crucial as a basis for the third step auditors must take to minimize the likelihood of undetected control deficiencies.

Table 5

Risk Factors

1. Known aspects concerning the design and past performance of the control system.
2. Competence of Management - The less competent the management, the higher the risk of control deficiencies.
3. Size of Unit - The larger the unit under review, the greater the magnitude of potential losses; therefore, the greater the demand for control within narrow error limits.
4. Recent Changes - Probability of control system deficiencies likely to be greater during "break-in" period.
5. Complexity of Operations - Probability of error increased.
6. Liquidity of Assets - Possible target for defalcations thereby putting control system under increased pressure.
7. Economic Condition of Unit - The risk of control breakdowns is often greater in units which are under significant economic constraints.
8. Rapid Growth - Rapid growth stretches the personnel and management control system of an operation.
9. Extent of Computerized Operations - The degree to which controls are built into the processing functions of a computer may reduce visibility and attention paid to adequacy of control.
10. Time Since Last Audit - Effects of an audit diminish over time.
11. Pressure on Management to Meet Objectives - For essentially the same reasons noted in item 7.
12. Extent of Central Agency or Other Regulation - Higher-level controls may reduce overall probability of lower-level control deficiencies.
13. Level of Employee Morale - Low morale may be indicative of high control risk situations.
14. Political Exposure.
15. Work of External Auditors.

The determination of relative risk gives the auditor an initial indication of the likelihood of control deficiencies. Where the auditor believes that the probability of material deficiencies is high, the auditor will want to ensure that the audit tests performed and evidence gathered are more extensive than the situation where relative risk of control deficiencies is low. Increasing the extent of testing improves the auditor's confidence as to the likelihood that all material control deficiencies have been detected.

In summary, for two audit situations which differ in terms of relative risk the internal auditor is obligated to gather more evidence in that situation where relative risk is higher, given that the same degree of confidence is to be associated with the auditor's conclusions.

Audit Risk

Audit risk is the chance that material control deficiencies exist and are not detected by the auditor during the audit. Essentially an internal auditor's confidence in the validity of audit report conclusions is derived from the assessment of the chance of error indicated by audit risk.

The risk that audit procedures fail to detect material control deficiencies may arise from these different areas:

- an improper assessment of relative risk which resulted in a faulty design and scope of audit procedures (a specific form of non-sampling error);
- the possible impropriety of the auditor evaluation process as a result of faulty assumptions, observational bias and illogical conclusions (general forms of non-sampling errors);
- the inherent statistical problems of using a sample to make general conclusions about a system as a whole (the risk that the sample chosen is not representative of the larger population - a form of sampling error); and

- the inherent limitations in the effectiveness of chosen audit procedures (regardless of how well performed, an audit procedure may be unable to detect a certain kind of deficiency because it is the wrong procedure or because the underlying system is not susceptible to verification).

These sources of audit risk can never be eliminated but a specific awareness of them allows auditors to reconsider the measures they have taken to minimize the existence of error in their audit report comments.

Statistical sampling provides the auditor with a quantified measure of sampling error. Control over other forms of audit risk, however, is largely dependent on the competence of the audit staff who must ensure that the audit is performed according to the highest standards of due care.

Auditor Confidence – Summary

An auditor may best assess whether a reasonable level of confidence in the validity of audit conclusions has been obtained through analysis of the complement of such confidence: the risk that the auditor's conclusions are in error.

The preceding discussion on how the likelihood of auditor error can be assessed is illustrated in Figure 2. This figure shows that both management's efforts to ensure that effective controls exist, and the procedures carried out by the internal auditor, are screens which prevent the occurrence of undetected material control deficiencies. The auditor's confidence is ultimately based on the auditor's satisfaction that audit evidence-gathering strategies have been adequately adjusted to detect material control deficiencies. Adequate adjustment of the audit evidence-gathering strategies is further dependent on the adequacy of the auditor's assessment of relative risk.

Practical Availability of Audit Evidence

In the pursuit of being reasonably confident that no material errors exist, the auditor must necessarily be influenced by the practical constraints of time and cost on the quantity and quality of evidence available for review.

ASSESSMENT OF AUDIT RISK

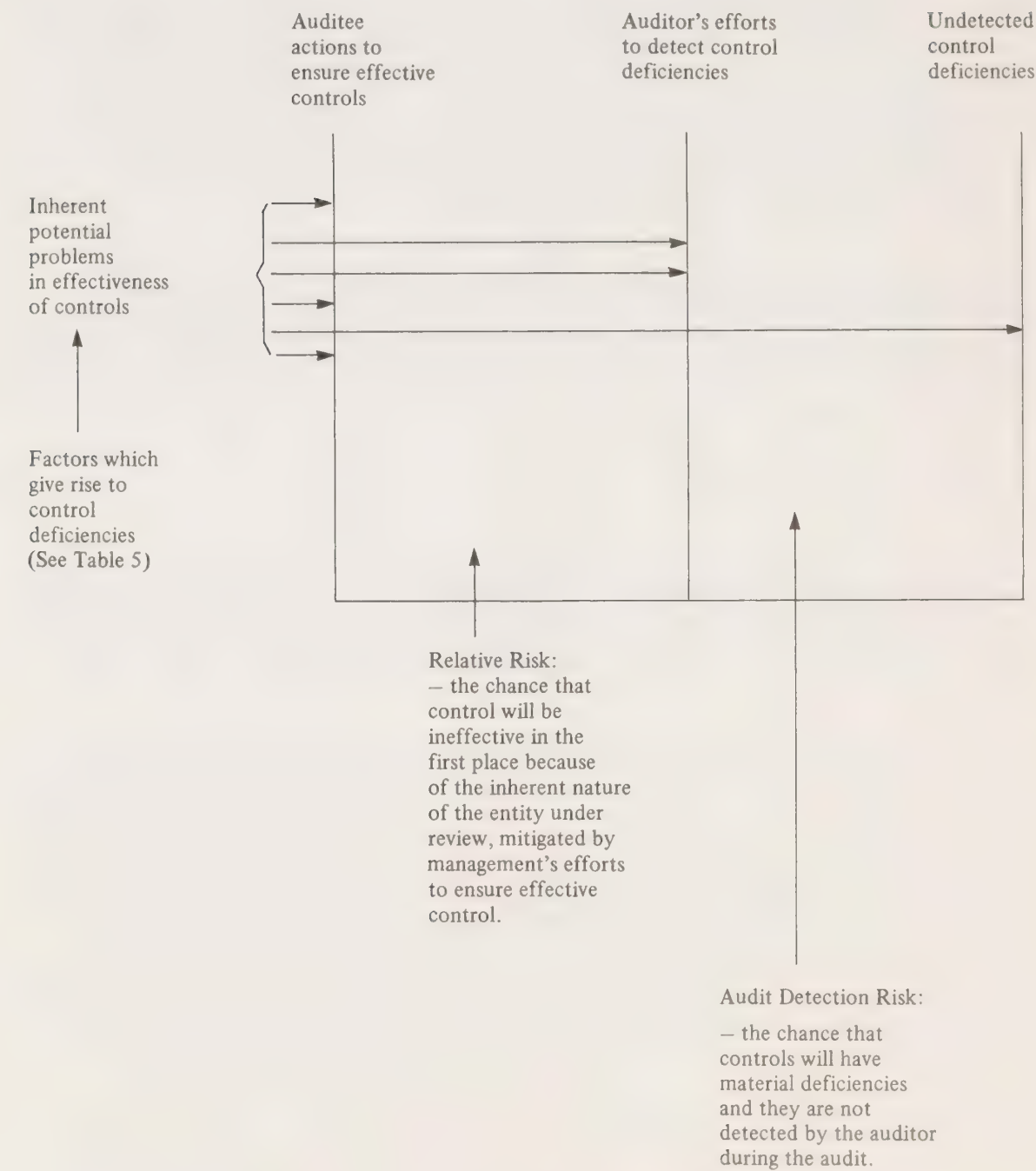


Figure 2

All audits face time and cost constraints. Audit reports which are delayed too long will be useless to the user. The cost of gathering audit evidence must not outweigh the utility derived from the audit report. Thus, although more precise and reliable audit evidence may be available to the auditor, consideration must be given to the additional cost or extended timeframe that must be incurred to gather the additional evidence.

The study of cost/benefit relationships is typically not formally done by auditors. It is clear, however, that such a relationship exists in audits. While readers of audit reports benefit from increased auditor confidence in audit conclusions based on evidence of sufficient detail, it is evident that enhancement of these benefits is achieved only at the cost of performing more extensive audit procedures. Auditors should explicitly consider, at least in rough qualitative terms, this cost/benefit relationship when determining what constitutes an adequate level of evidence for a particular assignment. In such considerations, the internal auditor should strive to achieve a basic understanding of the user's expectations concerning the audit. A careful determination of what users would like to have or, at least, would be prepared to accept in terms of audit results will help the auditor in resource allocation decisions.

Summary

In Section Three the discussion has centred upon what is meant by sufficient, valid and relevant evidence and what factors influence an auditor's assessment as to whether or not an adequate level of evidence has been gathered.

SECTION FOUR: AUDIT EVIDENCE EVALUATION

To ensure that the adequacy of evidence in fulfilling audit objectives is properly evaluated, the auditor should consider the following:

- Be aware of the assumptions which help structure the chosen audit approach. Various assumptions exist in audits, allowing auditors to perform their tests in an efficient manner. Some of these assumptions include that: certain items under review are material or immaterial; certain types of evidence or audit procedures are more reliable than others; the degree of past errors in the control system under review influences the probability of current errors; and special audit procedures to test for collusive fraud, forgery or elaborately concealed defalcations are not expected. An auditor should maintain a sense of reasonable skepticism towards the validity of these assumptions. Faulty assumptions may cause the auditors to omit from their review, items of significance. The discovery of faulty assumptions will normally dictate the need for additional evidence.
- Ensure that the act of audit observation does not temporarily change the nature of the control activities subject to review. The occurrence of such a situation is called "observer contamination" and involves, typically, increased conscientiousness in the performance of control duties by persons aware of the fact that their activities are being observed by the auditor. Such contamination seriously reduces the value of any evidence related to the activity under review.
- Explicitly consider the auditability of the area subject to review and the need for any specialized skills to properly complete the audit assignment. Where such skill is required, the auditor will not be able to assess properly the adequacy of evidence gathered in fulfilling audit objectives without the addition of subject-matter expertise to the audit team.

- Ensure that observational errors have not arisen as the result of bias or from misapplication of audit procedures.
- Exercise professional judgment carefully, guided, where practical, by objective decision aids. Observational errors due to poor auditor judgment of required audit procedures, and improper audit conclusions resultant from invalid projection of test results, always constitute risks to the proper use of evidence which has been accumulated to fulfill audit objectives.

CONCLUSION

Few auditors would dispute that an understanding of the subject of audit evidence is central to an effective audit process. While agreement exists as to the importance of the subject, an explanation of what constitutes sufficient and appropriate evidence and how it might best be collected is generally not available in the literature written for public sector auditors.

The lack of information on audit evidence has resulted in greater reliance upon auditor judgment when determining what constitutes the proper gathering and evaluation of evidence. While this document clearly does not refute the importance of auditor judgment in all assignments, it has attempted to reduce the degree of auditor subjectivity by making explicit the factors and techniques which should be considered for all evidence decisions.

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A COMPARISON OF EXTERNAL AND INTERNAL AUDIT THEORY

This Appendix illustrates through comparison of the external and internal audit models that only a marginal difference exists in their underlying conceptual frameworks. Because of their similar nature, we have concluded that it is generally valid to borrow and adapt external audit concepts to the internal audit context in areas where it is practical and useful to do so. The extrapolation of external audit concepts is particularly beneficial to internal auditors where it is evident that the external audit model has been subject to more extensive research and development than its internal audit counterpart.

For example, we have found it useful to use external audit theory as a basis for establishing in the internal audit context, the position of audit evidence relative to other audit concepts. In addition, external audit approaches for determining how to properly gather and evaluate evidence can be usefully reformulated to fit with the internal audit process.

This Appendix begins with a summary of external audit theory. The similarities and differences between this model and the internal audit model are then presented to support the claim that it is valid to adapt external audit concepts to the internal audit context.

A Summary of External Auditing

External auditing is primarily concerned with the degree of correspondence between various assertions made in financial statements and established criteria. Financial statement assertions include, for example, that the enterprise subject to audit has, in fact, cash, receivables, inventories, etc., and that these items have been properly described and disclosed in the enterprise's accounts. Established criteria represent the standards through which the auditor evaluates whether the assertions are valid, and in external auditing these criteria are represented by generally accepted accounting principles.

External auditors are not required to ensure that financial results are reported in a mechanically exact manner; rather the external auditor seeks a fair presentation of results. This concept gives rise to the idea of materiality, or degree of precision required in financial reporting which will satisfactorily meet the needs of various users of such reports. Where "material" departures from the norms of the evaluative criteria exist, the external auditor is required to report on both the nature of the deficiency and its effect on the financial statements.

Included in external audit theory is also the concept of verification. This concept refers to the gathering and evaluation of evidence which allows the auditor to express an opinion concerning the fairness of financial statement assertions. The external auditor does not strive for absolute certainty respecting the validity of the contents of the audit report; rather a reasonable basis is sought. In this sense, not all evidence available is accumulated to support the contents of the audit report. Instead, the auditor determines what constitutes "sufficient and appropriate" evidence in addressing the needs of a particular audit.

Similarities and Differences

Despite significant differences in terms of the uses of the audit report, the subject matter reviewed and the evaluative criteria employed, there exists considerable similarities in the basic nature of internal and external auditing. In identifying the major similarities the following points should be recognized:

- Although the breadth of the subject matter under investigation in an internal audit usually differs from that of an external audit, the role of the auditor in both cases is essentially the same. Similar to the external auditor's role, the internal auditor attempts to establish the degree of correspondence between the subject matter under review and certain predetermined evaluative criteria. Whereas the subject matter of external auditing is specifically focused on financial control and reporting, the internal auditor's subject matter includes study of the adequacy of all controls in the area under review, including financial controls.

- Like external auditors, internal auditors do not seek exact correspondence between the actual auditee conditions under review and the standards of performance represented within the evaluative criteria. Below some level of detail relating to the adherence of auditee operations to established performance standards, auditors show little concern. Similar to the external auditor's concern for fairness as opposed to mechanical exactitude, the internal auditor seeks adequacy in operations, not perfection. The threshold of what constitutes a significant deviation from acceptable system behaviour gives rise to the need for a concept of materiality for internal auditors.
- Both internal and external auditors are required to report on significant departures from the standards embodied within the evaluative criteria. External auditors are required to disclose significant departures from generally accepted accounting principles, and internal auditors are required to disclose significant departures between actual system behaviour and the desired behaviour embodied in their criteria.
- Both internal and external auditors are obligated to seek out additional evidence for those areas where deficiencies are found. The external auditor uses the additional evidence to determine the effects of the deficiency on the financial statements. The internal auditor uses additional information on the causes and effects relating to the noted deficiency so as to illustrate the nature of the problem, its general significance and appropriate action to correct the problem.
- Internal auditors are bound to conduct examinations and verifications to a reasonable extent and the internal audit cannot give absolute assurance that non-compliance or irregularities do not exist. This requirement for reasonable assurance mirrors external audit practice. Internal auditors are faced with the need to select from available evidence that which constitutes sufficient, valid and relevant evidence for their particular purposes on any given assignment. In Section Three, the decision rules that external auditors use in determining the extent of evidence that must be gathered have been adapted for use by internal auditors.

Review of these similarities between internal and external audits reveals that many of the underlying audit evidence concepts are essentially the same, and that internal auditors may benefit by structuring their understanding of the audit process using the conceptual framework developed for external auditing.

While it is useful to draw from external audit theory wherever it is practical and appropriate to do so, internal auditors should also be aware of certain fundamental differences in the nature of the two types of audit. While these differences do not refute the conceptual framework put forward here, they do have an impact on the manner in which the internal versus external audit process is performed. The major differences include:

- the degree to which the auditor will approach users of the audit services and the nature of the relationship between them;
- the breadth of the subject matter reviewed during the audit (audit scope) and its effects on the audit process; and
- the nature of the evaluative criteria used in the audit.

Each of these areas is discussed below.

Users of Audit Services

In this document, the term "user" refers to the primary intended recipient of the audit report and the person for whom the auditor performs the audit services. The user is to be distinguished from the "auditee" who represents the manager responsible for the operations and activities which are the subject of the auditor's examination.

In general, the user of the internal auditor's services is much more readily identifiable than users of an external audit. In the federal government, the internal auditor typically performs duties for a deputy minister, or equivalent for agencies, or senior officials. Secondary users of internal audit reports would include departmental or agency managers subordinate to those noted above and external audit or central agency review groups who may wish to rely on the work performed

by the internal auditor. The external auditor, on the other hand, acts on behalf of the audited entity's "shareholders" and more generally to all readers of the enterprise's financial statements.

The fact that the internal auditor reports to a particular "user" is significant in that it provides the auditor with an opportunity of receiving input concerning the nature and extent of testing that would satisfy the user's needs. In external auditing, such input is essentially non-existent; it is only through the external auditor's professional associations that guidelines and standards are developed to aid in determining answers to problems relating to the nature and extent of audit testing required.

Subject Matter Differences

The subject matter of external versus internal audits represents an obvious area of difference. Whereas external auditors are primarily concerned with the fairness of financial statement presentation, internal auditors are also concerned with the economy, efficiency and effectiveness of all internal management policies, practices and controls.

The knowledge requirements of internal auditors will vary from external auditors as a result of differences in the subject matter under review. An internal auditor, for example, must have a broad understanding of management and operational controls and reporting procedures; an external auditor, on the other hand, requires a specialized knowledge of financial control and reporting. While these differences in subject matter skill should exist between internal and external auditors, it is the contention here that the methods by which both analyze their subject are essentially the same.

Nature of Evaluative Criteria

Both internal and external auditors seek to establish the degree of correspondence between the subject matter under review and predetermined evaluative criteria. Obviously the criteria used by external and internal auditors will differ due to the varying subject matter under review. Less evident, however, are differences in

terms of the degree of latitude allowed in the determination of what constitutes the appropriate criteria for an audit. In external auditing, the established criteria are widely accepted and codified by the Canadian Institute of Chartered Accountants in the form of generally accepted accounting principles. In internal auditing, evaluative criteria used to judge the adequacy of auditee operations have not been codified. To a large extent, these criteria are currently chosen on a judgmental basis by the internal auditor, typically supported by reference to authoritative sources and information derived from discussion with users and auditees.

Given this perspective on the nature of external and internal audit criteria, the major difference to note is the degree of latitude allowed in their determination. In external auditing, criteria are relatively fixed while in the internal auditing considerable flexibility may be allowed. Indeed, it may be that internal audit criteria will never reach the status of "generally accepted" but perhaps will require ongoing determination on a situational basis.

The fact that internal audit criteria are not as fixed or widely accepted as external audit criteria may give rise to differences in the manner in which the audit is conducted. Whereas it is rarely that external auditors would question the validity of the criteria which establishes the basis of their evaluation, it is quite plausible that internal auditors may find their criteria deficient in light of additional information which has come to their attention during the course of the audit review.

Summary

We have attempted to establish the major similarities and differences between external and internal auditing. While on the surface external audits appear quite different from internal audits because of their differing subject matter, criteria and uses, it is evident on closer examination that the two types of audit differ only marginally in terms of the analytical methods which provide the real substance to audit evidence theory. Because of their similar nature, we have concluded that there exists much potential for the borrowing and adapting of concepts between the two types of audit.

CHAPTER 6

AUDIT JUDGMENT, DECISION SUPPORT AND EXPERT SYSTEMS

INTRODUCTION

This chapter consists of three sections. Section One summarizes what is currently known about human problem-solving behaviour, focusing especially upon the limitations of human judgment and decision processes, including those of professional problem solvers such as auditors. The main point of the material is that structural aspects of human cognitive (thinking) processes impose rather severe limits on human problem-solving behaviour. These limits lead to reliance upon judgmental heuristics (i.e., short-cuts and rules-of-thumb). The heavy reliance upon judgmental heuristics leads to systematic judgmental biases which adversely affect the quality of professional judgments and as a result, limit the quality of solutions.

Section One also describes the nature of professional expertise, focusing on the nature, use and acquisition of knowledge, a necessity for coping with complex and difficult problems.

Given the limits of unaided human problem-solving as outlined in Section One, Section Two discusses principles of judgment enhancement that are relevant to auditors. This section includes coverage of planning aids, information gathering aids, documentation aids and information evaluation aids. Each sub-section describes several techniques for enhancing the ability of problem-solvers to deal with complex problems, or for reducing the deleterious effects of heuristics and biases.

The discussion in Section Two leads to a consideration of automated decision support and expert systems described in Section Three.

The contents of this chapter complement the contents of the preceding Chapters 4 and 5, dealing with analysis concepts and practices and with audit evidence respectively.

SECTION ONE: LIMITS OF HUMAN PROBLEM-SOLVING

Cognitive psychology treats problem-solving as the manipulation of an internal representation of an external environment (Hunt 1983).

When a person is given a problem to solve, unless it is of a completely familiar kind, he must first determine what the Problem is, understand it fully, and find some way of representing it to himself before he can go to work on it and seek a solution by heuristic search (Simon 1977, p. 74).

In keeping with this widely accepted model of problem-solving, we would expect an auditor attempting, for example, to prepare an audit plan to construct internal representations of the:

- initial problem situation -- in this case, his or her view of the assigned task of preparing the audit plan;
- goal situation -- his or her view of what an ideal or satisfactory solution would be; and,
- operations available for moving from the first to the second representation.

In some instances, particularly in complex situations, such operations may not be readily apparent, so the goals or the problem itself may be redefined by the auditor to permit a solution to be achieved, although this may not be a solution to the problem that was originally posed (Wright 1974, Shields 1980, Choo and Eggleton 1982).

As is apparent from the foregoing, the means of representing aspects of the problem situation figure prominently in the characterization of problem-solving, which has been described as finding the representation of a problem which would make the solution obvious.¹ A person's choice of problem representation determines the strategies available for problem-solving (Hunt 1983), which is commonly sub-divided into the following phases:

- setting goals,
- acquiring information about the task environment, in particular about problem structure,
- integrating systems of information (i.e., evaluating information and formulating judgments), and ultimately,
- choosing solutions (and acting upon them).

Certain aspects of problem-solving have been researched extensively for several decades, and some generally accepted findings are available, although for various reasons many of these findings have not found wide application in professional problem-solving environments (Slovic et al., 1977). These findings have two main aspects.

- First, there are common traits shared by all problem-solvers, professionals and laypersons alike, pertaining to structural features of human information processing such as:

1 Boritz (1981) discusses the potential importance of problem representation techniques in contributing to improved problem-solving by auditors evaluating complex systems. He hypothesizes that certain information-acquisition and/or structuring techniques, governed by the particular problem representation scheme used, may enhance a reviewer's understanding of the original auditor's problem-solving behaviour and conclusions, permitting better feedback from, and control over, the evaluation process; hence, better audit outcomes due to improved review and supervision, even if the techniques used did not directly improve the original evaluator's judgments. Some of these techniques are discussed in Section Two of this chapter.

- the structure, capacity and capability of short-term memory (STM),²
 - the nature of elementary information processing functions, and
 - the central role of rules-of-thumb (heuristics) and judgmental biases in support of information acquisition, evaluation and judgment formulation.
- Over and above these traits, there are features which figure prominently in distinguishing between experts and novices in professional fields including:
 - the nature and structure of knowledge in a particular domain (e.g., EDP audit domain) in long-term memory (LTM), and
 - the methods used to gain an understanding of a problem.

In summary, the problem-solving behaviour of experts may be contrasted with that of novices along the dimensions of knowledge of facts and problem-solving strategies and methods; however, generalized cognitive aspects of problem-solving behaviour also play a prominent role in determining the quality of solutions. Cognitive aspects of problem-solving act as constraints upon all problem-solvers and lead to the emphasis upon enhancements of, among other things, problem representations as a basis for achieving or improving the quality of solutions for all levels of expertise. In the next four sub-sections, cognitive traits are discussed in more detail and some of their implications are highlighted. First, structural aspects of cognitive processes are discussed. Next, heuristics and judgmental biases are covered. Third, a discussion of expert knowledge is provided. Finally, a model of professional problem-solving which integrates the discussion is presented. The purpose of this discussion is to introduce the general concepts and findings which have a direct bearing on the development of decision support and expert systems.

2 Both short-term and long-term memories are conceptualizations, not physically identifiable parts of the brain. Short-term memory is the part of the mind where problem-solving activity is considered to take place (i.e., a scratch pad). Long-term memory is the part of the mind where knowledge is considered to be stored, organized and developed (i.e., the encyclopedia).

Structural Aspects of Human Cognitive Processes

The human information processing model of cognition draws upon the computer for its central metaphor - characterizing cognition as a series of input, processing and output operations aided by auxiliary storage facilities and elementary information processing functions. Cues are pieces of information which are collected from the problem area and from its environment by sensory mechanisms and delivered into a part of the auxiliary storage area called short-term memory, where a mental image of the problem is created. Similarly, knowledge stored in another part of auxiliary storage called long-term memory is retrieved by the elementary information processes and deposited into the short-term memory (working storage) area.

In this view of human behaviour, emotions, motivations and personality traits are de-emphasized. Primary attention is paid to the way in which people perceive data, integrate information and make judgments, in short, how people process information.

In a review of the relevant research, Simon (1979, p. 386) summarized the important structural characteristics of human cognitive processes as follows (refer to Figure 1).

Cue Recognition

The cue recognition process, called the evocative mechanism, is quite rapid, requiring 3-500 msec.³ to access information in long-term memory; but, it depends upon the presence of familiar stimuli, or cues. In other words, problem-solvers recognize rather than discover, features in a problem (e.g., in a review of an internal control system).

³ 1 msec. = 1/1,000,000 of a second.

THE HUMAN INFORMATION PROCESSING MODEL OF COGNITION

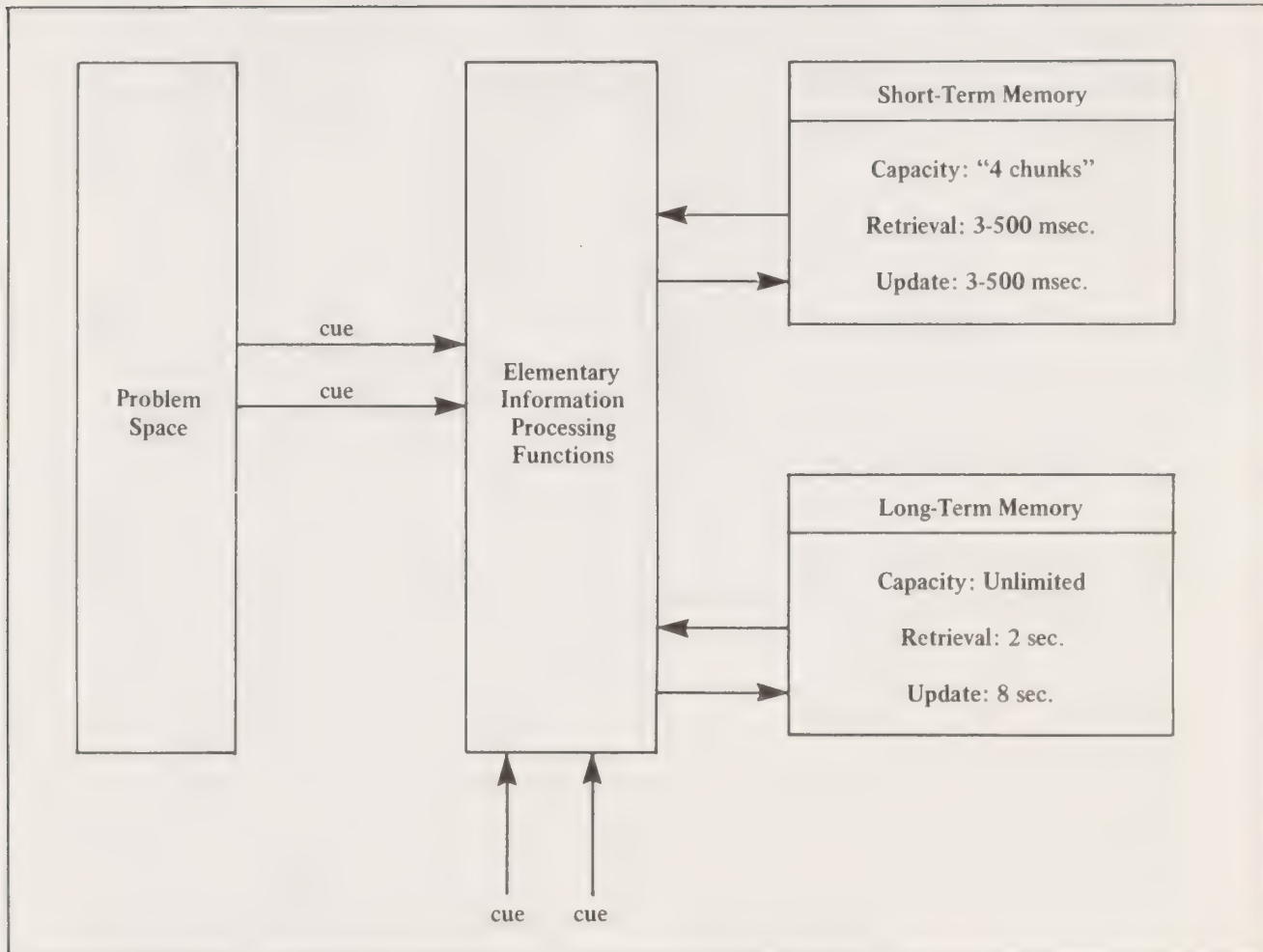


Figure 1

Knowledge (Long-term Memory)

Knowledge is stored in long-term memory, which may be viewed as an associative⁴ memory with virtually unlimited capacity. Access to stored information for purposes of retrieval requires about two seconds, while updating is quite a bit slower, requiring about eight seconds per familiar chunk.⁵ No significant learning takes place in tasks requiring less than one hour. In other words, many types of experience may not be experience at all if they have not been stored in the knowledge base.

Working Storage (Short-term Memory)

Short-term memory represents "working storage" for information chunks, the place where problem-solving actually takes place. It is characterized by fairly rapid retrieval and storage times of 3-500 msec. per chunk; but, very limited capacity, about four chunks in all. These characteristics permit only limited amounts of information to be used in a problem-solving search or hypothesis-generation at any given time. Since the amount of information that can be used is limited, its quality becomes an increasingly important consideration.

Many variables can influence behaviour and the quality of problem-solving that may result, including various personality traits, aspiration levels, motivation and incentive schemes, and so on. However, of all the potential limitations upon problem-solving, the most severe, and for all practical purposes the least flexible, is that imposed by the structural nature of short-term memory. Thus to improve task performance in complex problem settings may require the development of techniques specifically aimed at compensating for the constraints imposed by the structural characteristics of short-term memory. There are essentially two strategies for accomplishing this development.

4 In an associative memory, data are made accessible by the content of the data being retrieved rather than by its physical location.

5 A chunk is any organization of information that has previously become familiar (Simon 1979, p. 368). Thus, a chunk may be an individual element of information, or a pattern of many elements combined into a single unit for purposes of information processing.

- First, external short-term memories (e.g., computerized "scratchpads") with greater capability may be developed. This is the approach inherent in many automated support systems proposed as aids to professional problem-solvers.
- A second strategy focuses on the nature of chunks with the aim of assisting problem-solving by making each chunk contain more, and better, information or knowledge. This is the approach inherent in the use of training, procedural guidelines and expert systems.

Heuristics and Biases

Research findings enumerate a variety of heuristics and biases which determine to a large degree how information is acquired and how it is evaluated.⁶ Although often considered together, heuristics and biases may be usefully distinguished. Both represent potentially severe limitations on the quality of final judgments or solutions to problems; however, in general, a heuristic should lead to judgments being randomly distributed around some ideal "correct" value, while a bias would lead to judgments systematically falling on one side of the ideal.⁷ Biases may be viewed as the products of heuristics or short-cuts which fail in systematic ways.

Heuristics

A heuristic is a procedure which may solve a problem, but offers no guarantee of accuracy. In contrast, an algorithm, if correct, and if given sufficient time and resources, will always produce a correct solution. For example, suppose one wished to determine an employee's annual salary given an hourly pay rate of \$10.00. An appropriate algorithm would accumulate the hours worked for Jan. 1, Jan. 2 ..., Dec. 31 and multiply by \$10.00 (assuming no overtime) to arrive at the employee's annual salary. In contrast, a reasonable heuristic might be to multiply 50 weeks by 40 hours per week by \$10.00 per hour, arriving at an estimate of \$20,000. This

6 Hogarth and Makridakis (1981) reviewed and summarized a large number of behavioural studies emphasizing the flaws inherent in planning and forecasting activities. Mock and Vertinsky (1985) discuss some documented problem solving flaws as related to risk analysis in auditing/accounting.

7 Of course, several different biases could lead to judgments falling on opposite sides of the ideal value, and thus they could cancel themselves out.

estimate would rarely achieve the accuracy of the algorithm; however, for most purposes, it would yield a reasonably close estimate. Of course, many situations are far more complex and the use of heuristics, sometimes called rules-of-thumb or short-cuts, may not yield estimates of an adequate quality (i.e., accuracy). However, they are valued, sometimes inappropriately, because they reduce the amount of time or effort required to come up with satisfactory solutions. Heuristics, then, are problem-solving short-cuts affecting the way in which problems are viewed and solved. Researchers have identified three main types of short-cuts:

- Means-ends analysis (Simon 1969) is used to navigate through a problem space, affecting the thoroughness of information search.
- Elimination-by-aspects (Tversky 1972) is used to reduce the dimensionality of a given problem, affecting the number of factors considered in evaluating alternatives.
- Computational short-cuts are used to simplify otherwise complex algorithms, affecting the accuracy of solutions obtained.

Means-ends analysis: Means-ends analysis is one of the first heuristics identified by researchers and is described as follows:

Given a desired state of affairs and an existing state of affairs, the task of the problem-solver is to find the difference between these two states and then to find the correlating process that will erase the difference.
(Simon 1969, p. 112)

Thus, for example, given a model of a well-controlled system, and a representation of the client's actual system, an auditor would follow a selective process of identifying the differences and the control improvements which would eliminate them.

The implication of this heuristic for auditors is that the extent of information search will, in the absence of compensating mechanisms, depend heavily on prior experience, and will not necessarily obtain, in any reasonable time frame, the complete or appropriate information to bear upon a particular problem. The heuristic implies satisficing,⁸ rather than optimizing behaviour in the search process. Furthermore, even if an inappropriate goal state is selected by the auditor, that goal state will nevertheless guide the problem-solving behaviour. Also, if the current state is not accurately represented, the starting point for the search for a solution will be inappropriate. Finally, if the laws for linking the starting state and goal state are not well understood, the path traveled in the information search process (i.e., the line of reasoning) will likely be unacceptable.

Elimination-by-aspects: Tversky (1972) described choice as a covert elimination process. When faced with a multi-dimensional decision problem, the problem-solver is assumed to select a dimension or aspect.⁹ Then, all the alternatives which do not possess that aspect are eliminated. If more than one alternative remains, the procedure is repeated until all but one of the alternatives are eliminated.

The implication of this heuristic for auditors is that, in the absence of compensating features, the number of alternatives considered and the number of dimensions used for making comparisons and evaluations will be very small.

Computational short-cuts: An early set of studies (Einhorn 1972, 1974) suggested that while expert professionals were quite proficient at recognizing and diagnosing individual items of information (cues), they were poor at combining the individual cues into accurate global judgments. For example, suppose the goal is to discover T. By studying the repeated judgments of experts, a model is developed (e.g., by

8 Satisficing means taking the first satisfactory solution that "comes along". In contrast with optimizing, which implies searching the entire set of feasible solutions to find the best, a "pure" satisficing search will never search past the first feasible solution.

9 This selection could be based on: random selection; systematic evaluation of importance relative to all other alternatives; biases such as availability; or, external requirements, such as procedural guidelines, standards or rules.

regression analysis) suggesting that T is an additive function of A, B and C. Observations A° , B° and C° , are made and then T is predicted by T' , a guesstimate of the true status of T. Over two decades of research would predict that while a professional problem-solver would probably do quite well at observing A° , B° and C° , his/her guesstimate of T, T' would be quite unreliable. Indeed, a simple rule such as: "Add $XA^\circ + YB^\circ + ZC^\circ$ to get T' , where A° , B° and C° are observations made by a professional and X, Y and Z are estimated coefficients from a model based on that professional's own past performance, would consistently do better at predicting T than if the professional were asked for T directly.¹⁰ On the basis of findings such as these, Dawes (1974, 1979) concluded that the role of experts should be to determine which variables should be used, the direction of their effect, and to make observations of them, but leave the combining process to mechanistic rules or models, because such models will virtually always outperform the experts themselves.¹¹

Biases

Once information is acquired, evaluative judgments are made to permit inferences and conclusions to be drawn. In recent years, research findings have pointed out a number of recurring flaws in judgmental/inferential processes which interfere with, and systematically bias, the conclusions reached.

In a now classic and widely cited series of research studies, Tversky and Kahneman (1974) provided the foundation for much of the recent research into judgment and inference. They identified three sets of inferential biases resulting from heuristics that they termed representativeness (judgment by stereotypes rather than objective data), availability (judgment by ease of access to data rather than thorough information search) and anchoring and adjustment (judgment by precedent rather than independent assessment). Fischhoff (1975) identified the hindsight bias which suggests that in looking back at past judgments, problem-solvers find ways of rationalizing their behaviour, using what they know now rather than what they knew then. Consequently, they learn less from feedback than they should.

10 Even if X, Y and Z are simply replaced by I's.

11 These models can be more complex than simple addition rules and they can combine different specialists, judgments on a variety of different variables.

These flaws in judgment processes are considered to be inherent structural characteristics of the way in which humans encode experiences and the manner in which individuals make judgments. If they are structural in nature, these limitations cannot be corrected by mere changes in the incentive structure or by repeated experience. Nor are they characteristic of laypersons alone; but rather, are equally typical of professionals, experts, and so on.

Representativeness: The representativeness heuristic predicts that judgments about observations will depend heavily upon their similarity to other, previously encoded observations, and not on their objective representativeness of facts. Some of the biases included under this umbrella term are:

- insensitivity to prior probabilities of outcomes (i.e., the objective base-rate frequencies of outcomes); e.g., the objective base-rate probability for drawing an ace of spades from a fair deck is 1/52, about 2 per cent;
- insensitivity to sample size (i.e., attributing equal value to small and large samples);
- misconceptions of chance (i.e., holding false assumptions about the behaviour of random events);
- insensitivity to predictability (i.e., basing predictions on unreliable or unstable evidence);
- the illusion of validity (i.e., overemphasizing correlated variables despite the predictive superiority of uncorrelated variables);
- misconceptions of regression (i.e., failing to appreciate that extreme observations will be followed by less extreme ones, naturally, with a high probability).

Availability: The availability heuristic predicts that people will make judgments about frequency of a class of events on the basis of the ease with which similar instances or occurrences can be brought to mind, and not in accordance with their objective importance. Some of the biases included under this umbrella term include biases due to:

- retrievability of instances (i.e., overgeneralizing about a class on the basis of one salient instance in memory);
- effectiveness of a search set (i.e., overgeneralizing from knowledge retrieved on the basis of easily used search arguments);

- imaginability (i.e., overgeneralizing from easily imagined hypothetical events);
- illusory correlation (i.e., attributing common causes to items associated in memory structure).

Anchoring and adjustment: The anchoring and adjustment heuristic predicts that people will make estimates by first focusing on an initial value and adjusting from that value to reach a solution. Some of the biases related to this heuristic include:

- insufficient adjustment from an initial estimate,
- overestimation of probabilities of conjunctive events (i.e., unwarranted optimism about success),
- underestimation of probabilities of disjunctive events (i.e., underestimation of probabilities of failure in complex systems),
- anchoring in the assessment of subjective probability distributions (i.e., expressing more confidence about items than is warranted by actual knowledge).

Hindsight: The hindsight bias predicts that people, looking back at events that have happened, will exaggerate what could have been anticipated about them in foresight. They may even "misremember" their own predictions so as to exaggerate the predictability of events that have transpired (Fischhoff 1982). This bias can result in overconfidence in one's predictive ability as well as insensitivity to causes of errors or deviations from planned courses of action, since there is a tendency to conclude that more could have been anticipated, hence controlled, than was in fact possible at critical decision points in the past.

Fischhoff (1982) summarizes the key features of biases as follows:

- Biases result from, "the confrontation between a deterministic mind and a probabilistic environment"; i.e., they are typical of processes which involve uncertainty and require probabilistic inferences to be made about them by the problem-solver.
- Problem-solving flaws are most severe in the information integration phase of problem-solving rather than the information identification phase.

- Biases are due to cognitive limitations and are not due to misinformation or deception.
- Biases are measured relative to generally accepted norms for evaluating judgments. They are not concerned with varying preferences among individuals or for a given individual over time.
- Biases are the result of human intuitive judgment rather than artifacts of information systems.
- Biases are cognitive, not emotional in nature.

It is important to recognize that many erroneous judgments, inferences and decisions will not in themselves automatically result in severe negative consequences. Einhorn and Hogarth (1981) and Hogarth (1981) emphasize that a number of environmental or situational factors mitigate against such severe consequences. The most prominent of these, cue redundancy and feedback obtained through social interaction, permit tentative judgments to be made and then revised, perhaps several times, prior to a final conclusion or choice being made. However, Fischhoff's (1982) research suggests that professionals often tend to treat certain findings as if they "knew-it-all-along". This "hindsight" bias may prevent learning from mistakes and inhibit corrective action, even when feedback is available. Related research has consistently found that people are more confident of their judgments than their actual skill should permit them to be, even given feedback. Thus, although there has been much speculation about the role of feedback, its actual value in practice is neither clear nor well established.¹²

12 Reviewers can be hypothesized to play an important, even critical, role in providing corrective feedback about the initial evaluations made by auditors. Since, typically, reviewers are more expert than the original auditors who perform the initial work (e.g., initially evaluate the system of internal control) an interesting researchable question emerges about the way reviewers revise audit plans presented for their evaluation. Some research suggests that reviewers, in addition to 'suffering' from the same cognitive limitations as reviewees, tend to anchor on the work they are reviewing, making insufficient corrective adjustments.

The Nature of Expertise

Expertness in a professional domain is related to both the amount and the kind of knowledge stored in long-term memory and the efficiency of the evocative mechanism when responding to perceptual cues. Novices tend to process facts as individual elements. Thus, when the number of elements being processed exceeds an individual's short-term memory (STM) capacity, they begin to "drop off the edge", and information is lost. In contrast, experts in a given domain recognize a small number of patterns in a larger whole which they retain as chunks; thus, they are able to derive more meaning from a given set of environmental cues than can novices.

The combination of individual elements of information into composites or chunks representing patterns of elements is a defining characteristic of expertise in a given domain and is considered to depend upon two variables which can, at least partially, be controlled by professionals: professional training and field experience. The development of expertise is a slow process; a way of compensating for problems that may arise from the slowness of development is to embed the knowledge of an expert within a set of procedures especially designed to be followed by novices.

Experts are postulated to have databases of thousands of patterns with a structural organization conducive to ease of access. Thus, their knowledge can be brought to bear upon specific problems. In contrast, novices not only have a smaller reservoir of knowledge to draw upon, in terms of the absolute number of patterns, but also, and equally important, they have weaker structural interweaving of those patterns, affecting their ability to link knowledge with evocative perceptual cues (Simon 1979). This in turn affects both their ability to retrieve knowledge during problem-solving and also their ability to update old knowledge with new facts.

In distinguishing the expert and novice medical diagnostician, Johnson et al., state:

Contrary to the novice, disease knowledge of the expert is both precise and richly detailed. Through clinical experience the internal structure of experts...is "tuned" to the natural variation in findings. Such tuning generally allows the expert to properly interpret findings for a case that novices do not. Because of additional training as well as extensive experience, the expert also has a hierarchy of disease knowledge that is well organized and extensively differentiated. (Johnson et al. 1981 p. 237)

In much of the research dealing with expert knowledge, the ultimate goal is to aid professional problem-solving by transferring the skills of the expert professional to the novice by codifying, where possible, various aspects of expert knowledge into the procedures to be used by the novice.

In brief, knowledge is a key factor determining the quality of professional problem-solving. In addition to the absolute quantitative difference in the amount of knowledge possessed, the qualitative difference in the problem-relevant knowledge possessed by experts and novices distinguishes the quality of their respective solutions to problems. By focusing on the important differences between novices and experts in a particular problem-solving situation, a researcher might identify the gaps in knowledge which, if filled, might help novice professionals avoid committing serious errors. Eventually, critical knowledge might be built into expert systems; i.e., automated systems supporting the problem-solving behaviour of novices by mimicking experts.

There are three main aspects of expert knowledge which are of interest:

- the nature and structure of professional expertise (expertise = knowledge);
- the use of professional knowledge; and
- the acquisition of professional knowledge.

Expertise=Knowledge

The prevailing view is that there are essentially two categories of knowledge: case knowledge (Elstein et al. 1978) and systems knowledge (Feltovich 1978, Simon 1979).¹³

13 Feltovich (1978) describes the nature of medical case knowledge, but it is assumed here that the description is equally applicable to the accounting/audit context. It is an open issue whether experts in accounting/auditing are the same kind of experts (i.e., cognitively) as chess players or doctors.

Case knowledge: Case knowledge forms a large portion of any professional's storehouse of information. Thus, case knowledge: (i) includes knowledge about which environmental information cues are signals about which problems, errors, etc., (ii) is organized from the bottom-up, whereas basic accounting/auditing theory is organized from the top-down, and (iii) is used to generate diagnostic hypotheses.

Some case-based information items or cues correspond exactly to unique facts, hence such knowledge can help discriminate among several potential explanatory factors and permit conclusive isolation of the correct hypothesis. Other cues correspond to classes of facts. They can serve to discriminate among classes of hypotheses; but, cannot by themselves isolate a unique hypothesis.

Of course, case knowledge is often less than ideal. In particular, since case knowledge is integrated with general domain knowledge, in cases where domain knowledge is restricted (e.g., an auditor has no knowledge of the domain of on-line computer systems), the case knowledge will be overly specific and insufficiently generalized. In addition, since novices' causal links are often insufficient (e.g., an auditor may have no knowledge about many of the various causes which might explain a given control weakness), novices would tend to focus on a restricted sub-set of possible, but, in the given circumstances, incorrect hypotheses.

Systems knowledge: Systems knowledge refers to knowledge about the principles of normal behaviour of an "object", say an accounting system. Such knowledge may be used to reason abstractly about problems, detached from the particular information being observed. However, use of such knowledge is cognitively difficult or strenuous in comparison to the prototype-matching (i.e., matching against previous cases) exercise characteristic of the application of case knowledge which merely involves recognition of previously encoded "knowns" in a given situation. Thus, the use of systems knowledge is usually restricted to novel problems and generally is performed only by expert professionals, and then only in complex or novel problem situations.

The Use of Knowledge in Problem-solving

Experts display a learned ability to search the problem environment for specific cues in the task environment. In addition, by focusing on cues in a hierarchical fashion (i.e., from general to specific), experts are able to reduce drastically the size of the problem (in a manner similar to a binary search) until a solution (e.g., diagnosis) is reached. Finally, search efficiency and diagnostic accuracy are positively correlated with the amount of experience. More experienced physicians ask fewer questions and make fewer diagnostic errors, are better able to selectively discard irrelevant data, and to better retain only decision-relevant data (Kleinmuntz 1968).

Elstein et al. (1978) found that accuracy of cue interpretation was related to accuracy of diagnostic outcomes, but independent of thoroughness of cue acquisition. Thus, they concluded that thoroughness of data collection and accuracy of cue interpretation represent two separate dimensions to be studied. In addition, they suggested that lack of thoroughness is not as important a cause of error in medical diagnosis as problems of integrating and combining information. This would appear to be consistent with Hogarth's (1981) hypothesis that the cue redundancy prevalent in most task environments tends to reduce the "opportunity" for errors of omission. When cues are ignored it is due less to oversight than to missing evocative connections in memory; i.e., either missing knowledge or missing access paths to that knowledge.

More recently, Johnson et al. (1981) describe an intensive multi-method study of expert diagnostic reasoning in medicine. A series of three experiments was used to both explore and test hypotheses about expertise and error in medical diagnosis.¹⁴ Findings from the three experiments indicated the following:

¹⁴ In the first experiment, three groups of subjects were used: four experts, four trainees and four medical students. All were given the same patient data, and a process-tracing methodology was used to study the behaviour of subjects within the three levels of expertise. In the second experiment, a computer simulation model was used to identify conditions under which errors in reasoning discovered in the first experiment could be related to specific data cues provided in the case. Predictions derived from this analysis were then tested in a third experiment with a new sample of 12 subjects at three levels of expertise.

- The form of diagnostic reasoning was similar for all subjects trained in medicine, regardless of rank (and was successfully captured by a computer simulation model).
- The substance of the diagnostic reasoning by experts was similar to that represented in the simulation model, but not that of novices; i.e., it was possible to distinguish the substantive knowledge of experts from that of novices.
- Errors in subjects' reasoning were attributable to deficiencies in disease knowledge and the interpretation of specific patient data cues (and were capable of prediction by using the simulation model).

Johnson et al. identify three common errors in diagnostic reasoning by novices, resulting, they suggest, from the limited models used in medical training and relatively limited experience with any given set of laws, which lead to knowledge configurations with an internal structure that is fairly imprecise. These errors include:

- being too tolerant; i.e., failing to reject an inappropriate hypothesis,
- being too rigid; i.e., failing to entertain a correct hypothesis long enough because it is not precisely in line with expectations, even though it is within normal/allowable limits,
- simply not thinking of the correct hypothesis.

In Johnson et al.'s experiments, the less expert subjects exhibited a strong data-driven dependence in the flow of their reasoning behaviour; i.e., they seemed to be pushed from one hypothesis to another, depending on the most recent strong information cue that they observed in the data. In contrast, the more expert subjects followed lines of reasoning which incorporated the full set of competing hypotheses, although two different strategies were used, described as "breadth-first" or "depth-first" lines of reasoning.¹⁵

¹⁵ In a breadth-first line of reasoning, termed a "precautionary" strategy, a number of alternative hypotheses are generated early then simultaneously entertained; so, if evidence which disconfirms a particular hypothesis is encountered, the subject can easily switch to an alternative. In contrast, a depth-first line of reasoning is characterized by the pursuit of one hypothesis until strong disconfirming evidence is discovered. Success in such a line of reasoning depends upon the diagnostician's ability to reject the current hypothesis, when appropriate, and to jump to a new one. This requires relatively precise knowledge.

These findings suggest that judgment enhancement should not look to improve professional problem-solving by manipulating the form of reasoning; instead, the emphasis should be upon the substance of reasoning, focusing on the factors which lead the expert to the right conclusion when the novice, following the same line of reasoning, errs.

Of course, experts are not immune to errors. Even experts can err if data in a given case are missing or are not adequate to trigger the appropriate prototype, so that even though the correct model exists in memory, it is not considered. In addition, as mentioned previously, both experts and novices alike are limited in their capacity as information processors; hence, heuristics and biases are likely to affect the manner in which information is evaluated. Novices would tend to base their 'biased' conclusions on a smaller set of experiences, focus on less appropriate cues in the environment, and search in a smaller range of the problem space, while experts would display better, but nonetheless biased and erroneous, judgments; for example, when their prior expectations serve to overemphasize cues which conform to those expectations and underemphasize weaker cues which do not so conform.

Acquisition of Knowledge

Acquisition of knowledge depends upon learning, which requires both understanding and remembering. Empirical research, summarized by Simon (1979), has demonstrated that:

- skill gained in solving one form of a problem will not always transfer to isomorphs of the same problem (i.e., essentially similar systems, such as sales/receivables/receipts, to be evaluated for different clients may not benefit from skill transference). In general, skills are more likely to transfer downstream (i.e., from a harder to an easier task) rather than upstream (i.e., from an easier to a harder task);
- rather minor and seemingly innocent differences in the "cover story" (or problem representation) can alter the amount of time required to perform a task;
- changes in problem difficulty are associated with changes in problem representation; and,
- no significant learning takes place in tasks requiring less than one hour.

In addition, as was pointed out in the discussion of expert knowledge, the weaker structural interweaving of patterns reduces the amount of learning that novices can derive from a given situation despite what may seem to an expert to be an abundance of information in the case.

A Model of Professional Problem-solving

By way of summarizing the foregoing discussion, a professional problem-solving model, based on a synthesis of the research relevant to the accounting professional's task environment, may be viewed as consisting of the following phases:

- goal selection/clarification/definition;
- observation of environmental cues; i.e., search, selection, screening, rejection and grouping of data;
- application of specialized knowledge; hypothesis generation and cue interpretation;
- evaluation of problem representations and conditional search continuation (i.e., formulation of conclusions and strategies for further action, conditional on goal attainment);
- learning; i.e., memory revision.

In this model, (refer to Figure 2) the task environment is considered to be an objective cue-generator (i.e., the cues do not depend upon the problem-solver). A goal-directed, but otherwise relatively mechanistic, "operating system" senses cues, retrieves information from long-term memory, and deposits information into short-term memory. The representation in short-term memory of what is consciously known or understood about the problem under consideration includes the information so far gathered from the environment, active hypotheses (i.e., current speculations about what the problem is), and eventually, conclusions based on data. The generation and evaluation of hypotheses is affected by cognitive limitations, heuristics, judgmental biases and conscious strategies for acquiring and evaluating information.

Johnson et al. (1981) emphasize the central role of knowledge in professional problem-solving. The expert auditor has:

MODEL OF PROFESSIONAL PROBLEM-SOLVING

TASK ENVIRONMENT

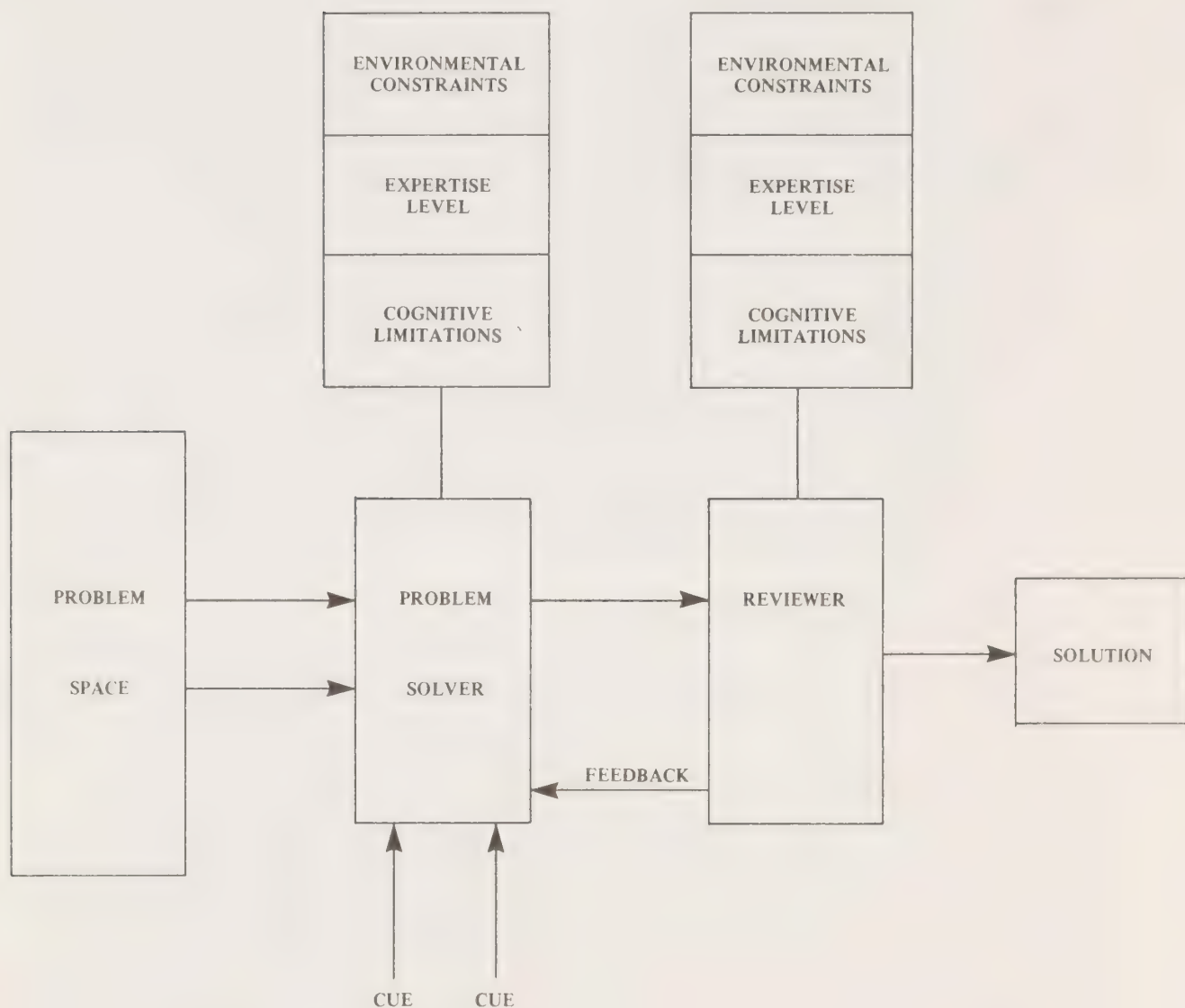


Figure 2

- a collection of prototypes organized into categories and sub-categories around which facts would be clustered;
- a list of procedures which should be performed when gathering task-specific information and knowledge of how such procedures should be executed;
- knowledge of laws and principles governing the domain of his/her situations.

Other personal attributes are excluded from the model (e.g., emotions, motives, personality traits, etc.)¹⁶ However, as Elstein et al. (1978) emphasize, the problem-solving process cannot be considered solely as a template-matching process. The problem-solver is not indifferent to the outcome to be selected. Thus, personal goals, values and other interferences will affect the outcome ultimately chosen. The greater the opportunities for applying discretion, the more likely it is that these interferences will influence the problem-solving process. As a result, to the extent that discretion is a characteristic of a professional practice, the judgments made will reflect the preferences of individual problem-solvers. This in turn leads to essentially non-comparable judgments, and the definition of expertise in such a case becomes quite tenuous.

The greater the problem-solving skill (expertise) possessed by a professional, the fewer errors expected, relative to professionals with less expertise carrying out the same task. Indeed, even when they err, the errors of expert professionals are considered to be of a qualitatively different type than those of novices or laypersons (Johnson et al. 1981). However, as tasks become more complex, experts will likely commit more errors relative to their own performance in less complex tasks. Table 1 summarizes some of the potential audit consequences of human problem-solving limitations in the absence of compensating features. The precise nature of errors committed, including their frequency and pervasiveness among various tasks and various experience levels, are researchable issues with important implications for professional practice.

16 Refer to Sjoberg (1982) for a discussion of these factors.

Table 1

What can go Wrong in the Absence of Compensating Features

Flow of Audit Work through Time

(Top to Bottom and Left to Right)

| <u>PROBLEM-SOLVING PHASE</u> | <u>Documentation/Preparation of System Representations</u> | <u>Review/Evaluation of Representations By Documentor</u> | <u>Review Feedback by Reviewer</u> |
|----------------------------------|---|--|--|
| GOAL PERCEPTION | <ul style="list-style-type: none"> - Document the "wrong" system - Stop too soon | <ul style="list-style-type: none"> - Misinterpret objectives - Answer the "wrong" question | <ul style="list-style-type: none"> - Perceive goals incorrectly |
| CUE PERCEPTION/ RECOGNITION | <ul style="list-style-type: none"> - Gather insufficient information - Gather irrelevant information | <ul style="list-style-type: none"> - Fail to see relationships - Focus on wrong, irrelevant cues | <ul style="list-style-type: none"> - Inefficient search and restructuring of poorly structured representations - Focus on wrong or irrelevant cues - Fail to catch missing cues |
| INFORMATION EVALUATION/ JUDGMENT | <ul style="list-style-type: none"> - Draw incorrect inferences about the quality of the representation of the system | <ul style="list-style-type: none"> - Draw incorrect inferences about the quality of system | <ul style="list-style-type: none"> - Draw erroneous inferences due to missing or incorrect information about both representation and system |
| CHOICE/ DECISION | <ul style="list-style-type: none"> - Settle on an incomplete, confused, inaccurate, misleading portrayal of the system | <ul style="list-style-type: none"> - Choose wrong aspects of system to focus upon as strengths and weaknesses | <ul style="list-style-type: none"> - Choose wrong aspects to provide feedback - Choose wrong corrective strategy |

Source: Boritz (1981)

Ultimately, research efforts in these areas may permit the design of effective techniques for enhancing professional problem-solving skills. However, care must be taken to avoid the criticism of Simon (1965):

All these aids to human thinking, and many others, were devised without understanding the process they aided -- the thought itself". (Simon 1965, p. 92)

It is of critical importance, prior to developing and testing problem-solving aids and judgment-enhancing techniques, that adequate research be conducted to provide an understanding of what goes on during the problem-solving process when accountants/auditors exercise their professional judgment, and in particular, the recurring kinds of errors or flaws that might to be prevented or minimized through the implementation of such systems.

SECTION TWO: PRINCIPLES OF JUDGMENT ENHANCEMENT OF RELEVANCE TO AUDITORS

The problem-solving literature indicates that there are three major sources of errors:

- errors due to reliance on heuristics (i.e., rules-of-thumb, short-cuts, etc.) which limit (a) the amount of information sought out and processed at any point in time, and (b) the sophistication of the combinatorial processes used for integrating various pieces of information;
- errors due to the nature of the encoding, storage and retrieval mechanisms applied during the acquisition and use of professional knowledge, which limit the kind of information available for and used in problem-solving; and,
- errors due to the nature of the task environment, in particular those aspects of complex tasks which prevent the problem-solver from gaining an adequate understanding of the essence of the problem.

Various aids have been proposed to compensate for problem-solving flaws and to enhance problem-solving activities through the use of structure, mathematical models and automation. Slovic (1982) concludes that in developing aids to improve decision-making it is important to develop techniques for structuring decision problems and for simplifying the large complex decision trees which are characteristic of such problems:

Now that we understand many of the biases to which judgments are susceptible, we need to develop debiasing techniques to minimize their destructive effects.... Simply warning a judge about bias may prove ineffective. Like perceptual illusions, many biases do not disappear upon being identified. It may be necessary to (a) restructure the judgment task in ways that circumvent the bias, (b) use several different methods allowing opposing biases to cancel one another, or (c) correct the judgments externally, based on an estimate of the direction and strength of the bias.

Dealing with Biases

Fischhoff (1982) identifies a variety of strategies for dealing with biases (refer to Table 2) which depend on critical assumptions about the source of the observed behaviour such as whether the bias is the result of faulty tasks, faulty problem-solvers or a mismatch between problem-solvers and tasks.

Table 2

Debiasing Methods according to Underlying Assumptions

| ASSUMPTION | STRATEGIES |
|---|--|
| <u>Faulty tasks</u> | |
| Unfair tasks | Raise stakes Clarify instructions/stimuli Discourage second-guessing Use better response modes Ask fewer questions |
| Misunderstood tasks | Demonstrate alternative goal Demonstrate semantic disagreement Demonstrate impossibility of task Demonstrate overlooked distinction |
| <u>Faulty problem-solvers</u> | |
| Perfectible individuals | Warn of problem Describe problem Provide personalized feedback Train extensively |
| Incorrigible individuals | Replace them Recalibrate their responses Plan on error |
| <u>Mismatch between problem-solvers and tasks</u> | |
| Restructuring | Make knowledge explicit Search for discrepant information Decompose problem Consider alternative situations Offer alternative formulations |
| Education | Rely on substantive experts Educate from childhood |

Source: adapted from Fischhoff (1982)

Faulty Tasks

Not all flawed behaviour is attributable to limitations of human cognitive processes. Faulty tasks are tasks in which poor performance results from the nature of the task rather than the nature of the problem-solver. For example, a task may be considered to be faulty if a problem-solver:

- doesn't care about it,
- is confused by it or misunderstands its requirements,
- doesn't believe in the stated goal of the superordinate who designed the task or adopts other goals,
- can't express his or her true understanding due to limitations in the communication channel or inability to articulate inner thoughts,
- falls into a stereotypic behaviour pattern simply to get through the task.

Faulty Problem-solvers

If a task is not faulty, then attention is shifted to the characteristics of problem-solvers instead, the subject of Section One of this chapter.

There is a distinction to be drawn between perfectible problem-solvers and incorrigible problem-solvers. Perfectible problem-solvers can be helped through:

- warnings about the potential for bias,
- descriptions of directions of biases,
- feedback,
- training.

Research suggests that the assumption of perfectible problem-solvers leads to unrealistic expectations and inappropriate blame and is of limited value in dealing with structural features of cognition. Incorrigible problem-solvers require continuous

support to achieve quality performance.¹⁷ Such support may be provided in the form of various debiasing techniques; for example, Mock and Vertinsky (1985) suggest the following techniques:

- automatic correction for specific biases,
- alert users about possible biases,
- "triangulation" through multiple methods of eliciting judgments,
- provide system-produced information prior to judgment (e.g., base rates),
- provide dialectical estimates (e.g., rival judgments, possibly random).

Some or all of these strategies may be incorporated into systems designed to support managerial and professional problem-solving activities.

Mismatch between Problem-solver and Task

In many situations, it will likely be the case that performance quality will be contingent upon both the problem-solver and the task. Two main decision-support approaches are to:

- restructure tasks to suit the individual,
- educate or train individuals to perform the tasks.

Restructuring involves techniques aimed at:

- encouraging/forcing problem-solvers to express what they know explicitly rather than simply accepting gut feeling intuition as the basis for judgment,
- encouraging problem-solvers to actively search for disconfirming evidence rather than confirming evidence to corroborate a given (preferred) assertion,

¹⁷ As used here, the term incorrigible is used to contrast with perfectible. No derogatory connotation is intended.

- decomposing complex problems into several less complex components,
- using different ways of looking at things, different terms, etc.

Education, the alternative, involves the use of specialists or experts to replace faulty problem-solvers in performing the tasks. In some cases, these experts could be computer programs which mimic the problem-solving behaviour of human experts.

Planning Aids

Planning involves several important judgment activities, the most prominent of these being:

- problem definition and goal formulation,
- setting or identifying the problem-solver's expectations for outcomes (this sometimes includes estimating prior probabilities).

Since problem-solving behaviour is so strongly goal-directed, it becomes important to use techniques which help the problem-solver identify and express the most appropriate definition of goals based on consideration of sufficient alternatives and focusing on the key information.

In general, this may be accomplished by ensuring that:

- information is gathered from as broad a base as possible as part of the problem-definition/goal formulation activity. Also, new information should be added as soon as it becomes available,
- formal and disclosed methods are used rather than informal, hidden ones; i.e., assumptions are revealed and peer review is solicited.

Techniques which may be useful for gathering and summarizing information for planning purposes are:

- Delphi,
- Analytic Hierarchy Process,
- "Policy Capturing" (sometimes called bootstrapping),

- Simulation.

These are described below at a summary level to introduce the techniques. More detailed descriptions may be found in the references cited.

Delphi

Delphi is a group-process technique for eliciting, collating and directing informed (expert) judgment toward a consensus on a particular topic (Delp et al. 1977, p. 68). Individuals debate anonymously by mail through a set of questionnaires. The responses are then collected, collated and analyzed by a design team. Based on the results of the analysis, another questionnaire is developed. The process continues with rounds of questionnaires until all opinions converge. This technique is useful in soliciting opinions from various groups in the organization in the process of setting audit objectives, identifying important concerns, creating a system of priorities and designing an audit framework.

The Delphi technique can assist in establishing goals and priorities which are acceptable to the entire organization, thus contributing to congruence between a department and the larger organization. It can be used to define the scope, dimension and attributes of the problem, and permits equal participation of groups with varying backgrounds.

The technique allows active participation of well-informed executives who are geographically scattered and also allows active participation of knowledgeable executives who cannot afford the time required for group meetings.

The anonymity provided by Delphi may reduce the impact of biased opinions of certain dominant groups and may elicit more genuine responses than might otherwise be obtained; for example, in group meetings. By having individuals think through and respond on their own, the Delphi process avoids tunnel vision and bandwagon thinking and encourages diverse and speculative thinking (Wedley 1977).

Ratings from Delphi studies provide quantitative scores for evaluations even though these evaluations involve subjective and intuitive thinking. These ratings can aid in choosing a course of action (Wedley 1977). The number of Delphi respondents can be incremented with very little extra cost.

One of the potential limitations of Delphi is that desirable features of a group meeting, such as instant communication, brainstorming and intellectual stimulation, may be lost (Delp et al. 1977). In addition, it requires some time, approximately six weeks, to gather, assimilate and analyze responses. The respondents must have good written communication skills, as well as a high degree of interest and commitment throughout the process to maintain the necessary quantity and quality of responses after successive rounds of questionnaires.

Delphi can help the internal audit department gather informed outside opinions as a basis for organizing and directing its activities. This planning exercise cannot be carried out frequently due to the effort required on the part of the participants as well as the coordination required while it is being carried out. It can be applied once every three to five years and in a very specific way help identify the key factors to be used in important planning decisions such as audit-priority determination, personnel arrangement, coordination of plans with external auditors and auditees, areas of emphasis, etc. Further details may be found in Boritz (1983b).

Analytic Hierarchy Process

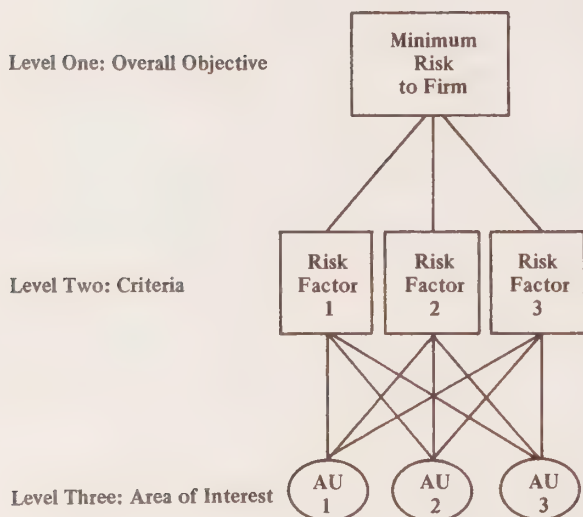
Saaty (1980) described analytic hierarchy process (AHP) as "decomposition by hierarchies and synthesis by finding relations through informed judgment". The idea is that a system is better perceived by decomposing the complexity of the structure into its components and finding hierarchical relationships among them. The relative strength with which elements at one level influence those of the upper level is measured by a series of pairwise comparisons (i.e., evaluating components two at a time).

The concept of AHP may be useful in structuring audit-risk evaluation and personnel-development decisions, among other analyses. Figure 3 illustrates the hierarchical relationships among overall audit objectives, risk factors and audit units. The

ANALYTIC HIERARCHY PROCESS

Source: Adapted from Patton et al. (1982)

Figure 3.A
Analytical Hierarchy



Source: Patton group (adapted).

Figure 3.B

| Risk Factor | Risk-Factor-Importance Scale | | | | | Scale Eigenvector* |
|---------------------|------------------------------|-----|-----|-----|---|-----------------------|
| | Comparison Matrix | | | | | |
| | 1 | 2 | 3 | 4 | 5 | |
| 1. Size | 1 | 5 | 3 | 2 | 7 | 0.4475 |
| 2. Liquidity | 1/5 | 1 | 1/2 | 1/3 | 2 | 0.0897 |
| 3. Personnel Change | 1/3 | 2 | 1 | 1/2 | 3 | 0.1540 |
| 4. System Quality | 1/2 | 3 | 2 | 1 | 4 | 0.2534 |
| 5. Complexity | 1/7 | 1/2 | 1/3 | 1/4 | 1 | 0.0554 |
| | | | | | | 1.0000 |

*The eigenvector has been normalized to sum to one.

Figure 3.C
Audit-Unit-Risk Scale

| | Size Factor* | | | | Scale |
|--------------|--------------|-----|-----|-----|--------|
| | AU1 | AU2 | AU3 | AU4 | |
| Audit Unit 1 | 1 | 3 | 4 | 8 | .5735 |
| Audit Unit 2 | | 1 | 2 | 4 | .2334 |
| Audit Unit 3 | | | 1 | 2 | .1287 |
| Audit Unit 4 | | | | 1 | .0644 |
| | | | | | 1.0000 |

*The lower half of the matrix is not filled in because, under this methodology, these values are constrained to be reciprocals of the corresponding entries in the upper half; e.g., the entry for the fourth row and first column would be "forced" to be 1/8.

Audit-Unit-Risk Matrix

| | Size (from Figures 3.B, 3.C) | Liquidity | Personnel | System | Complexity | Overall Risk Measure* |
|-----|---------------------------------|-----------|-----------|--------|------------|-----------------------------|
| AU1 | .5735 | .1167 | .5609 | .1602 | .1096 | 0.4002 |
| AU2 | .2334 | .2107 | .1762 | .2726 | .2672 | 0.2343 |
| AU3 | .1287 | .0770 | .2006 | .0999 | .0560 | 0.1238 |
| AU4 | .0644 | .5956 | .0623 | .4673 | .5672 | 0.2417 |
| | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

*This is the normalized result of multiplying (i.e., by matrix multiplication) the eigenvector in Figure 3.B and the Audit-Unit-Risk Matrix in Figure 3.C.

Figure 3

apex shows an example of the overall objective which an organization might aim to achieve. To achieve this objective, individual risk factors have to be identified and eliminated or minimized. To minimize risk, audit resources have to be allocated among audit units depending upon their individual risk exposure, assuming that audits reduce risk.

The relative importance and extent of risks of each audit unit can be measured by pairwise comparisons based upon the professional judgment of audit planners and recorded in a table. Through the application of mathematical techniques to the table of pairwise comparisons, the underlying scale values can be derived. The overall risk for each audit unit is determined by calculating a weighted average-risk measure.

AHP provides a framework which aids in the systematic and scientific evaluation of risks affecting audit units and a logical link between the amount of risk and resource allocation. An open-group process is used for determining risk factors which may encourage intellectual stimulation.¹⁸ A higher level of confidence is placed on the relevant risk factors since they are agreed upon by the group, and the derived scale values represent the most consistent judgment of the group.

Some limitations of AHP are that the derivation of the scale values from the pairwise-comparison matrix is a complicated mathematical process and requires computer software. Also the process becomes time-consuming as the number of comparisons increases.

Additional information may be found in Boritz (1983b) and Patton et al. (1982). Lin, Mock and Wright (1984) describe the use of AHP as an aid in planning the nature and extent of audit procedures.

18 But this group process may also have undesirable consequences, as discussed at the end of Section Two in "Humans as Synthesizers".

Both Delphi and AHP are useful techniques in structuring risk evaluation.¹⁹ Both approaches aim at reaching consensus through simple, repetitive processes. Delphi uses rounds of questionnaires, and AHP uses a series of pairwise comparisons.

With Delphi, participants respond anonymously to avoid the influence of a dominant group, whereas with AHP, an important set of variables and judgments is established by an open-group process. In Delphi, disagreements are resolved by successive review and revision of questionnaire results on an anonymous basis, whereas in AHP, differences in views are resolved by open discussion among informed participants.

Delphi supports statistical and quantitative analysis of numerical responses gathered from questionnaires, whereas AHP uses absolute numbers, one to nine, to reflect qualitative judgments based on pairwise comparisons that are subsequently used to derive an estimate for the underlying scale. Lastly, Delphi has no built-in mechanism for checking the consistency of responses, whereas AHP permits consistency checking.

Policy Capturing (Bootstrapping)

An early demonstration of bootstrapping by Yntema and Torgersen (1961) suggested that if an automated aid could be developed to capture the judgments or policy of an expert, then its performance will be better than (or at minimum, as good as) the expert's unaided judgment process by virtue of eliminating inconsistencies in human task performance from case-to-case or time-to-time. Camerer (1981, p. 411) concluded that, "bootstrapping will improve judgments slightly under almost any realistic task condition".

19 There are other approaches (e.g., multi-attribute utility decomposition (MAUD)) designed to help decision makers in structuring, decomposing and recomposing preferences in situations involving several alternatives which have several dimensions (attributes) of importance to the decision. The value of these approaches is through reduction of goal confusion and through consciousness raising about the structure of attribute importance ratings (Humphreys and McFadden 1980). For further information refer to Edwards and Newman (1982).

Bootstrapping is based on the use of linear statistical models such as regression analysis. The models are developed by using data gathered from repeated applications of judgment, either for one person over time, or for many people at one point in time.

Regression analysis is a technique that expresses the average relationship between two or more variables. It relates a dependent variable with an independent variable(s) in the form of a mathematical equation derived by the "least-squares" method. It is a relatively straightforward process for establishing a norm for a given relationship based on the patterns of past data. However, it may be misused if the relationship between the dependent variable and independent variable is valid only within a restricted range. Also the regression model may be invalidated when factors that govern the relationships are changed and require a new model. In addition, aggregation across people or time periods may not always be valid. Although it requires some tedious computation, computer programs are available for this purpose.

One of the fundamentals in this technique is that the model captures the important factors and eliminates (i.e., relegates to random error) the unsystematic interferences due to heuristics and biases. Figure 4 illustrates this technique; further information about this technique may be found in Einhorn (1972).

Simulation

Simulation is a process of conducting experiments on a model of a dynamic system in lieu of either direct experimentation with the system itself or direct analytical solutions of problems associated with the system. It is a symbolic or numerical abstraction of the process under study and not the process itself. For example, audit plans are vulnerable to changes in business operations such as acquisitions of new subsidiaries, automation, budget cuts, work force shortages, changes in key audit personnel, changes in risk factors and similar events. By changing relevant parameters to correspond with expected changes in relevant factors, possible effects of changes on audit plans can be observed and studied.

EXAMPLE OF REGRESSION COMPUTATION FOR 'BOOTSTRAPPING'

Past Data

| Audit period | 1 | 2 | 3 | 4 | 5 |
|---------------------------------|------|-----|-----|-----|-----|
| Estimated complexity points (x) | 350 | 300 | 150 | 250 | 200 |
| Audit time (hours, y) | 1000 | 950 | 500 | 750 | 750 |

Computation of Regression Coefficients

| (1) x | (2) y | (3) x- \bar{x} | (4) y- \bar{y} | (5) (x- \bar{x}) (y- \bar{y}) | (6) (x- \bar{x}) ² |
|-------------|----------|---------------------|---------------------|--|-------------------------------------|
| 350 | 1,000 | 100 | 210 | 21,000 | 10,000 |
| 300 | 950 | 50 | 160 | 8,000 | 2,500 |
| 150 | 500 | -100 | -290 | 29,000 | 10,000 |
| 250 | 750 | 0 | - 40 | 0 | 0 |
| 200 | 750 | - 50 | - 40 | 20,000 | 2,500 |
| Total 1,250 | 3,950 | 0 | 0 | 78,000 | 25,000 |

| | | | | |
|-------------------------------|-----------------|-----|-----|------------------------------------|
| Aver- ages $\bar{x} = 250$ | $\bar{y} = 790$ | 0.0 | 0.0 | $b = \frac{78,000}{25,000} = 3.12$ |
|-------------------------------|-----------------|-----|-----|------------------------------------|

$$b = 3.12$$

$$a = 790 - (3.12)(250)$$

$$= 790 - 780$$

$$= 10$$

Regression equation is $y = 10 + 3.12x$

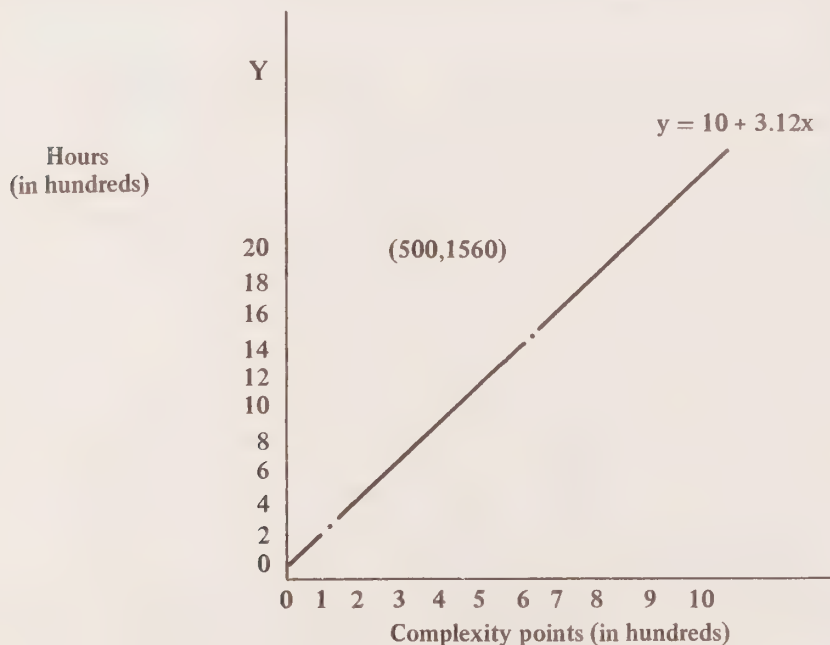


Figure 4

Simulation is the most effective means of analyzing complex systems when analytic and numeric solution methods are deficient for unravelling a problem or are impractical to apply. The approach shows the effects on system components of varying conditions, assists in forecasting system behaviour, and permits study of a wide range of alternative policies without actually working on the physical system.

Potential limitations of a simulation model are that it does not by itself provide a solution to any problem, but provides an understanding of the relationship among the components of a system. The usefulness and reliability of conclusions derived depend on how closely the model represents reality. To achieve this, simulation experiments may require large volumes of data. The unavailability of adequate data is often a major obstacle in developing simulation models. Rigorous application of this technique requires familiarity with simulation statistics, computers and interactive terminals; thus, a payoff may come only after auditors gain necessary experience. This potentially learning curve may be costly and time-consuming. Less rigorous methods may, of course, be used; e.g., the widespread use of spreadsheets for "what if" types of analyses is a less rigorous, yet still useful, method for simulating the behaviour of quantifiable variables.

Information Gathering Aids

Elstein et al. (1978) studied doctors' diagnosing behaviour. They found that every physician who at any time considered the correct solution to the diagnostic problem, selected that solution only as the final diagnosis. This finding serves to emphasize the importance of preventing premature restriction of hypotheses entertained by professional problem-solvers. There are two key aspects to ensuring adequacy of information search: breadth of search and depth of search.

According to Cutler:

Many educators and physicians regard all of diagnosis as a huge branching tree. They feel that diagnosis consists of simply tracing one of a large number of pathways through a system of branches. Each of these systems is in reality an algorithm or series of questions with yes or no answers directing the branching process. The physician quickly derives a few important clues and departs down one branch of the diagnostic tree. If pursuit is hot, questions continue along that line. But if he finds by a series of negative responses that he is going in the wrong direction, he comes back to a node and follows another branch. (p. 38)

Breadth of search requires searching across a sufficient number of nodes at a given level of a hierarchy. Depth of search requires searching down through a sufficient number of levels of the hierarchy. Although the analogy between medical and audit information-gathering should not be stretched too far, the hierarchical, structured approach to information gathering described can be helpful in ensuring complete and thorough search by a problem-solver, possibly utilizing expert guidance embedded or incorporated in the search tree.²⁰ Second, information gathered in this way can be readily transferred to graphical representations such as flowcharts and/or other diagrams. Third, the process can be computerized and guided by an unobtrusive operating system free of biases, which could, in addition, combine cues and generate hypotheses for consideration by the auditor. These are the tasks which, as we have previously noted, professionals do not perform particularly well.

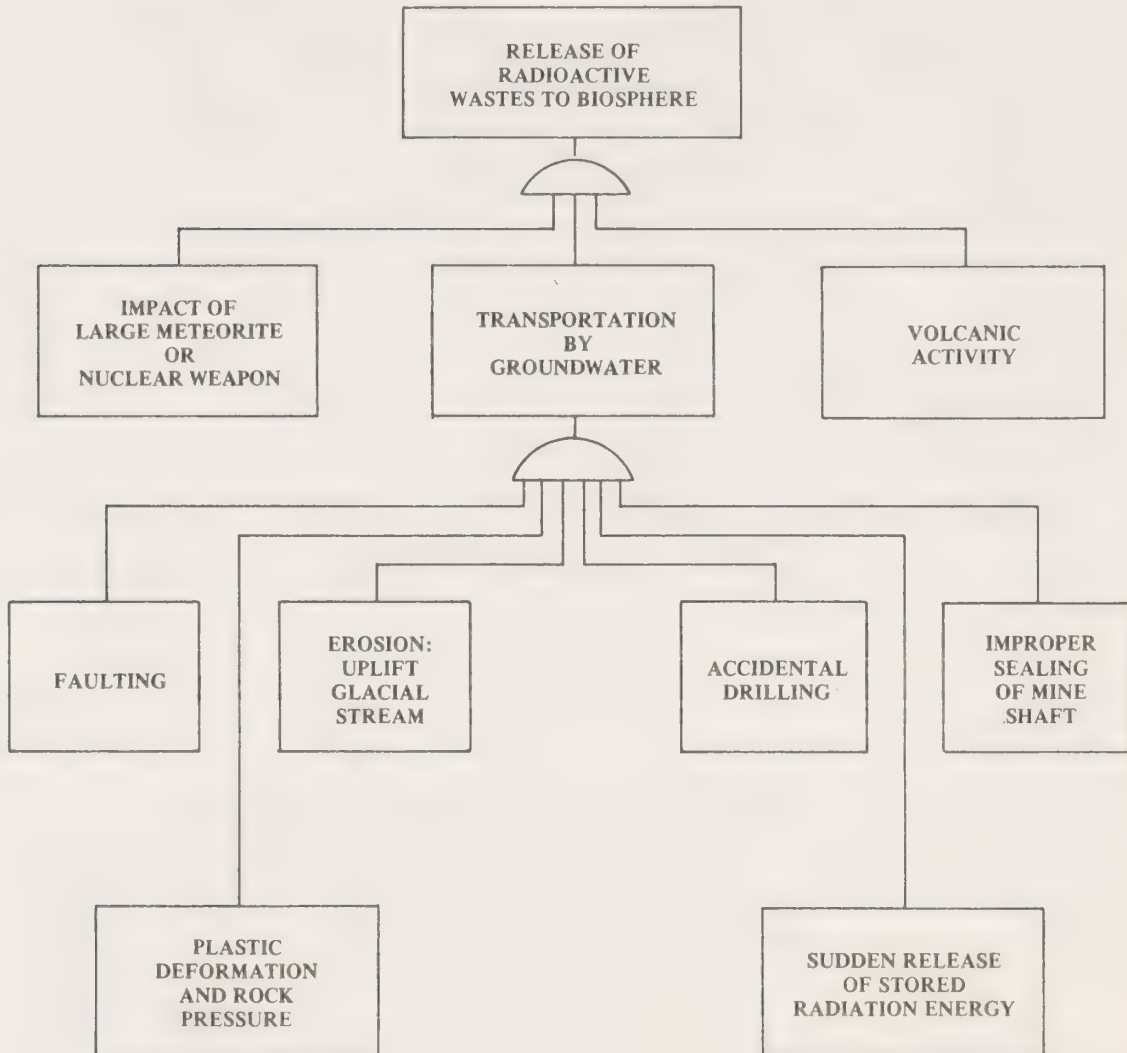
In a similar vein (see Figure 5) Fischhoff et al. (1978) describe the fault tree technique and its application to such complex systems as nuclear power plants. Libby (1981) suggests that fault trees could be used as extensions of flowcharting techniques since they, in contrast with the flowcharts' emphasis on transaction flows, emphasize possible system failures. When fault trees are used in conjunction with analyses of complex systems, the approach is to first define sub-system failures which would cause overall system failure. Then, individual component failures related to each sub-system failure are listed (as branches) along with their inter-relationships.

The construction of fault trees forces pre-specification of all conceivable causes of a given failure. Thus information search and hypothesis generation are guided and the problems associated with premature hypothesis restriction can be avoided or reduced. It should be noted that preparing such specifications is not an unreasonable effort to be expended since, although in a more haphazard and often implicit fashion, such specifications form part of most large public accounting firms' audit programs. One of the strengths of Computer Control Guidelines (CICA 1970) was that it took essentially this approach (refer to Figure 6).

20 Dickhaut and Eggleton (1975) used this technique to elicit the heuristics their subjects used during an experimental task.

FAULT TREE

Source: Slovic, P., Lichtenstein, S., and Fischhoff, B., "Images of Disaster: Perception and Acceptance of Risks from Nuclear Power", in G. Goodman and W. Rowe (eds.) Energy Risk Management, London: Academic Press, 1979.



Fault tree of salt mine used for storage of radioactive wastes (after closure of the mine).

Figure 5

FAULT TREE STRUCTURE OF CICA COMPUTER CONTROL GUIDELINES

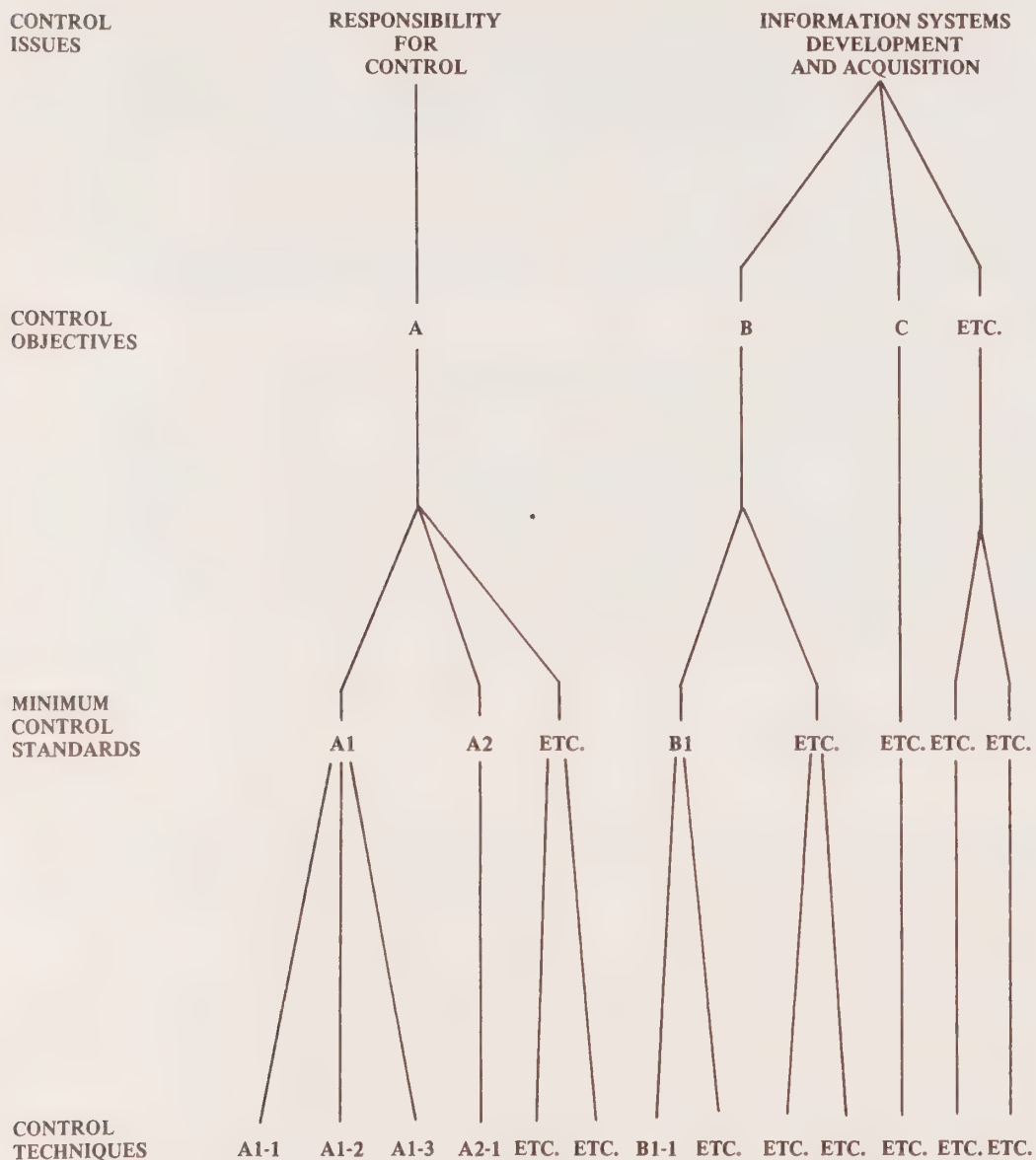


Figure 6

Documentation Aids

Although many forms of audit documentation are in use, they have often been considered as substitutes for one another, rather than as specific tools useful for specific aspects or phases of the auditor's problem-solving activities, and less useful, even dysfunctional, for other aspects. Whereas in well-structured problems such substitutability may be possible, it is unlikely to be very effective in complex task environments. Nor can one method serve all phases of problem-solving. Some techniques may enhance the information search process, whereas different techniques may be particularly valuable for enhancing evaluation phases of problem-solving by auditors.

In developing the technology of auditing, it seems appropriate to take into account the purpose and potential usefulness of various audit documentation techniques, and with these in mind, to tailor existing techniques, or develop new ones to enhance audit problem-solving. Such investment in technological improvements in auditing is particularly feasible since many audit tasks are repetitive and since there exists a relatively well-specified procedural knowledge base.

Simon (1969, p. 109) reminds us:

One might suppose that the description of a complex system would itself be a complex structure of symbols . . . but there is no conservation law that requires that the description be as cumbersome as the object described. (Simon 1969, p. 109)

Complex systems are hierarchical in nature and tend to display a high degree of cue redundancy. As such, Simon (1969, p. 110) makes the following assertions:

- They are usually composed of only a few different kinds of sub-systems, in various combinations and arrangements, so that hierarchic representation can be a major facilitating factor for simplifying and thus enhancing both the description and understanding of complex systems.
- They are often nearly decomposable; i.e., only aggregative properties of their parts enter into the description of the interactions of those parts. Thus little information is lost by using hierarchical representation, providing that such representations are prepared by trained individuals. Otherwise, if untrained individuals do prepare the representations, detailed information about relations of sub-parts belonging to different parts is likely to be lost.

- By appropriate "recoding", the redundancy that is present, but unobvious, in the structure of a complex system, can often be revealed; for example, replacing a description of a sequence of steps by a description of the process that generates that sequence, can help simplify an otherwise complex problem.

Alexander's (1964) classic work devoted considerable attention to the problems of representation. In his view, diagrams may have two important and distinct qualities (p. 89):

- they may summarize "physical" structure (i.e., the formal characteristics of what the system is), and
- they may summarize a set of functional properties or constraints (i.e., denote the goal to be achieved, or what the system does).

Moreover, Alexander asserts that good diagrams contribute to understanding not just the specific problem at hand, but also the broader concepts reflected therein. Since we seldom understand the broader conceptual context fully, we may not at the outset see it as a single pattern; therefore, diagrams often precede the precise knowledge which, if it existed, could prescribe their shape on rational grounds. However, some principles can help guide the representational direction that ought to be taken. According to Alexander (1964, p. 127), each diagram must:

- bring out just those features of the problem which are relevant to the given set of requirements,
- include no information which is not explicitly called for by the requirements,
- be so specific that it has all the physical characteristics called for by the requirements, yet
- be so general that it contains no arbitrary characteristics, and so summarizes abstractly, the nature of every representation that might be satisfactory.

Although the complexity of internal interactions may make it impossible to find a single adequate diagram, simpler diagrams may help to get at the problem, and Alexander concludes that:

- A hierarchical representation of the most significant sub-sets of the set of requirements may help find such simpler diagrams.
- Each sub-set can in turn be translated into a set of smaller sub-sets which, by virtue of having fewer requirements and interactions, are able to be better understood.

These points, however, are easier said than done, since in fact there are two opposing goals -- analysis (decomposition) and synthesis. The initial goal is to fragment the problem into smaller sub-problems.

The ultimate goal, however, is to form a unit, bringing elements together in such a way as to create one cohesive solution. The need for sub-sets which can be grasped through the use of diagrams calls for sets of variables whose internal interactions are very rich, or tightly coupled functionally. However, the need to resolve conflicts between sub-sets calls for as little interaction between them as possible. Therefore, to accomplish these goals, we should begin by constructing diagrams for the smallest sets prescribed, building up compound diagrams according to the hierarchical structure used to sub-divide the larger problem in the first place. In other words, this means top-down sub-division (i.e., division and partitioning) of a system into a tree of components, but bottom-up representation (i.e., successive composition and fusion) to obtain a tree of diagrams.²¹

Thus, the tree becomes the theoretical basis for all representations. A tree is a set of sets of variables whose relevance can only be understood in terms of their functional relationship to the other variables in the set. With reference to Figure 7, compare panels X and Y. It seems apparent and obvious that Y is far more straightforward in appearance than X; however, X seems to be a closer approximation of what we are accustomed to seeing as systems descriptions today. In advancing the tree (hierarchy) for representation of complex processes, Alexander (1964) asserts that it provides an explicit description of the implied structure of a process, and it gives the strongest possible decomposition of the problem that does not interfere with the task of synthesizing its parts in a unified way (i.e., each subsidiary problem defined has its own integrity and is as independent as it can be of the rest of the problem).

21 For an interesting application of these concepts refer to Pirsig's, Zen and the Art of Motorcycle Maintenance (1974).

HIERARCHICAL REPRESENTATION

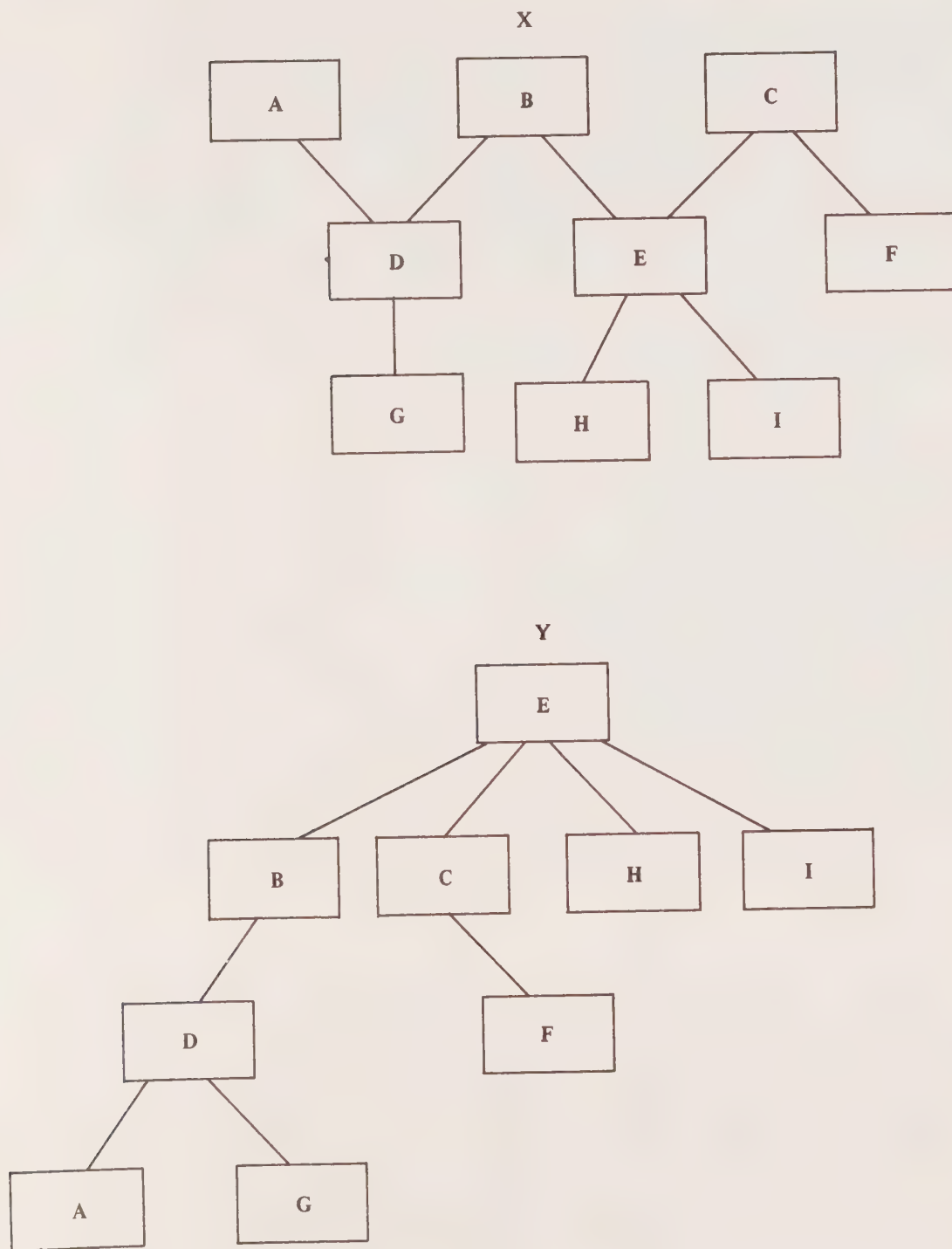


Figure 7

Structured Representation Techniques

Even a casual review of some of the structured systems analysis and design methodologies reveals that they are, virtually without exception, essentially hierarchical decomposition and representation "technologies" grounded in the preceding theoretical arguments. There are a number of techniques, each with supporters and detractors; while comparison of their merits and deficiencies is outside the scope of this chapter, a good comparative analysis can be found in Peters (1981),²² who classifies representation techniques into four categories:

- system architecture,
- design structure,
- database structure, and
- software behaviour.

Representing system architecture: Peters (1981, p. 43) claims that system architecture is the least understood and most poorly addressed area of representation. Its objective is to help in the communication of primary conceptual issues by depicting major portions or functions of a system and their relationship to one another. Therefore, this type of representation must highlight the span of control and the relative importance of individual sub-systems in the larger scheme of the system. In addition, representation techniques in this category must provide a means of focusing upon the critical issues or the goals set for the system.

22 Although both Simon (1969) and Alexander (1964) conclude that there are essentially two types of representations for describing complex systems (i.e., state/structure descriptions, and process/ function descriptions), Saarinen (cited in Peters 1981) adds a third factor, style -- i.e., why a system does what it does in a particular way. Peters (1981) building on these three elements, function, structure and style, identifies four categories of representation techniques; i.e., system architecture, design structure, database structure and software behaviour; and then classifies twenty-eight representation techniques proposed for describing computer-based systems (unfortunately, the link between representations of manual portions and computerized portions of systems is not made clear).

In particular the following are considered to be the important attributes in representations of system architecture:

- hierarchic organization of system elements,
- sequence (precedence) of processes,
- priority levels of processes,
- external interface with parties outside the system boundaries,
- interactions among modules within the given application system,
- internal interfaces between application system programs and the operating system,
- user requirements expected to be met by system functions,
- process logic of modules within the application system.

Peters rates Leighton diagrams as being currently the most effective technique for representing system architecture. An example of a Leighton diagram is provided in Figure 8. This method is used to represent software system architecture in an hierarchical manner, but avoids detail in favour of a highly simplified, easy-to-understand format. The ABC Sales System presented consists of five main modules, whose sequence of execution (in general) flows as indicated from top to bottom. Each module in turn consists of sub-modules, the "calling" hierarchy moving from left to right. Finally, the inputs and outputs are indicated at the extreme right, with source/destination device and nature being shown by using standard flowchart device symbols and vectors. Boritz (1983a) applied Leighton diagrams to internal control questionnaires (see Figure 9).

Representing design structure: Structure is an umbrella term for the many types of relationships present in a given system; e.g., hierarchy, inclusions, equivalence, precedence, execution sequence, and scope of control. The important attributes of representations of design structure include the following:

- hierarchical organization of system elements including separate and specific treatment of data flow and control flow,
- capability for portraying precedence or sequence of processing events,

REPRESENTING SYSTEMS ARCHITECTURE: LEIGHTON DIAGRAMS

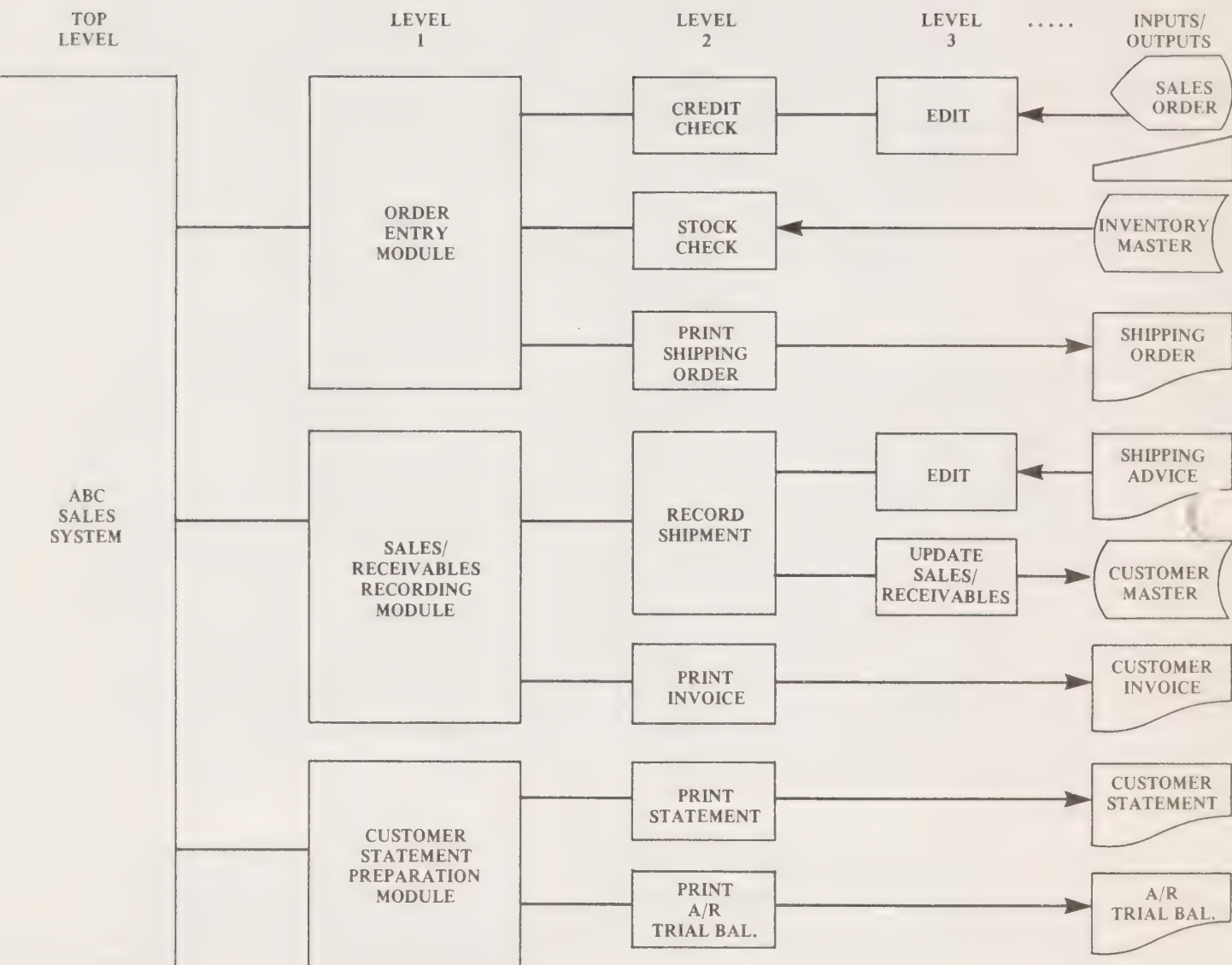


Figure 8

USE OF LEIGHTON DIAGRAM TO HIGHLIGHT STRUCTURE OF INTERNAL CONTROLS

Source: Boritz (1985a)

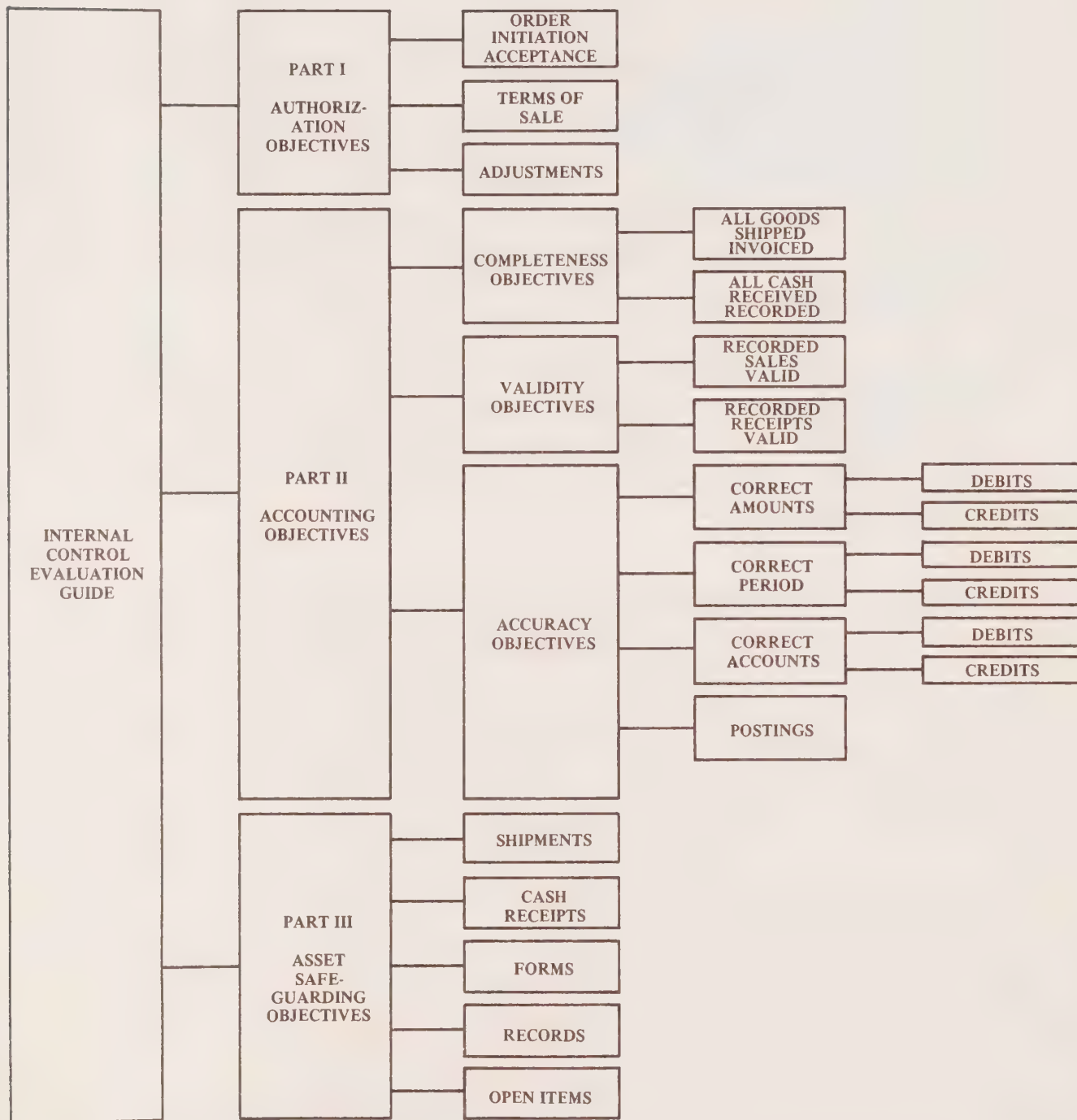


Figure 9

- means for representing process logic of individual modules,
- explicit depiction of individual modules and the communication among them.

Structure charts were originally developed by Stevens, Myers and Constantine (1974). A hierarchical approach is used to represent module interaction, and information communicated between modules is explicitly shown, in particular data flows and control parameters are graphically depicted. Figure 10 shows the design structure of the order entry module previously shown in Figure 8. Modules are represented by rectangles. Data flows are represented by arrows with open circles, and control parameter flows are represented by arrows with closed (shaded) circles.

Representing database structure: Although this is a newer area of representation than the activity-oriented schemes, it has grown in importance in recent years. Activity-related schemes are unable to highlight important logical attributes of data; and so, as data management has increased in importance, so to have database representation schemes.

Auditors have, by and large, avoided using data analytic²³ techniques. Indeed in the past it was both convenient and justifiable to focus attention on physical files of data as units of control, rather than selecting logical elements within those files, because the two were combined. This is no longer the case. However, continued use of physical files as units of control has left many procedures ill-specified in terms of the logical entities, their attributes and the relationships among them, to which audit attention should be given.

For example, is the product master file the unit of interest, or is it specific attributes of products (e.g., the price and quantity fields) which are of audit importance? And if the latter, then the fields are irrelevant without the following relations being considered as well:

23 Some of the techniques in use today include: Chen's entity-relationship approach (discussed in Peters, 1981, Ch. 5), Senko's (1975) logical data structure, data dictionary systems, data structure diagrams, problem analysis diagrams, and a number of other less well-known techniques described by Peters (1981).

REPRESENTING DESIGN STRUCTURE: STRUCTURE CHARTS

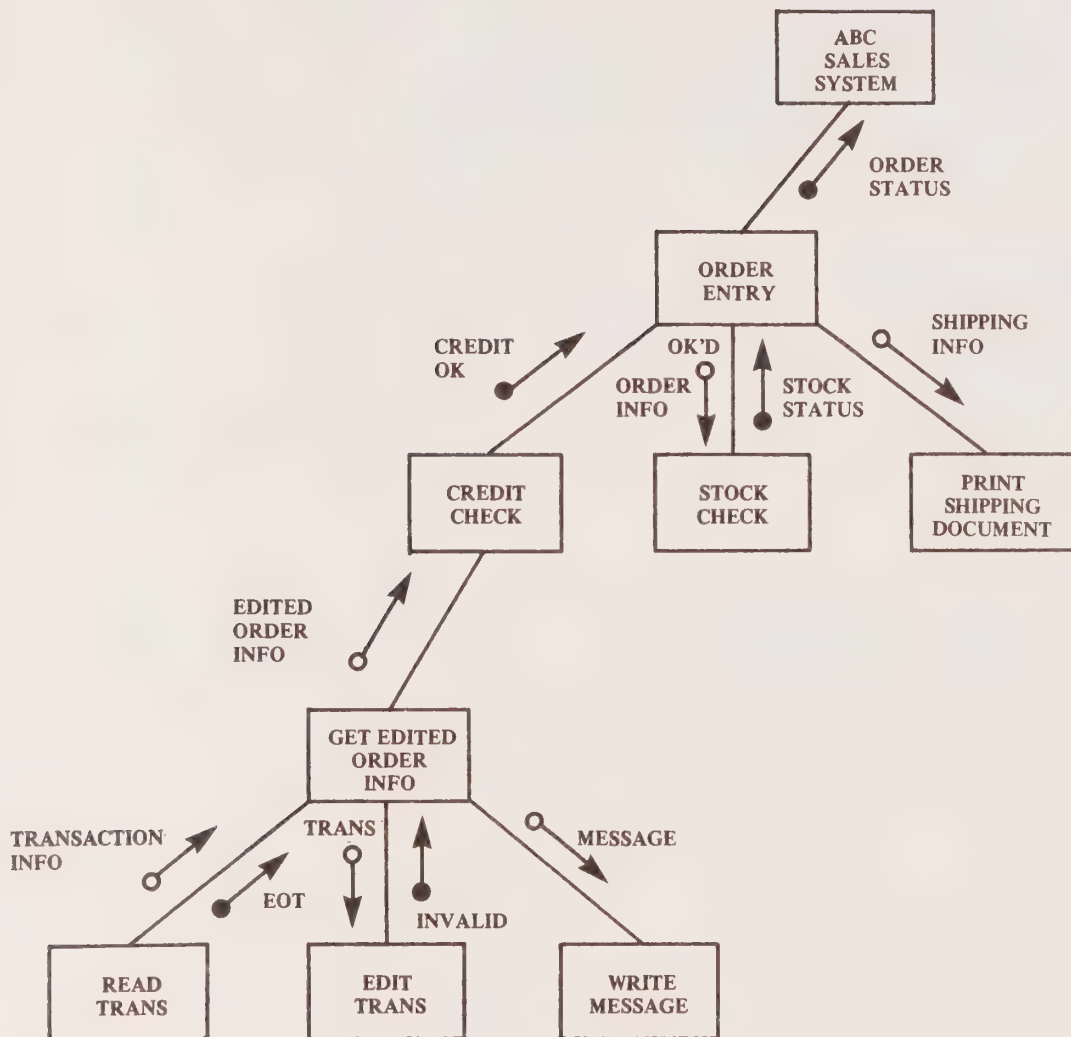


Figure 10

- price-of-part-number,
- quantity-of-part-number.

Mair et al. (1978) and others have suggested that auditors' analyses be refined by focusing on specific data elements and logical relationships among them. Auditors should consider adopting data analytic techniques such as logical data structure diagrams as aids for separately representing logical and physical data structures, isolating key entities and relationships, evaluating controls and designing audit tests.

An example of a logical data structure diagram is presented in Figure 11. Its essential features include the use of simple ovals to represent entities and attributes and named arcs to represent relationships. To represent many-to-one relationships, "chicken-feet" are added to the appropriate end of an arc. Many-to-many relationships are not permitted, except if redefined into their component many-to-one relationships.

Representing software behaviour: Flowcharts have been traditionally one of the most popular audit documentation tools; however, they have fallen into disrepute among current writers in the software engineering field such as Yourdon and Constantine (1979). Peters (1981) asserts that flowcharts are based on the belief that a program should be documented after it is written. As a result, flowcharts suffer from several weaknesses which limit their usefulness. They are not considered very usable in the process of arriving at descriptions of system behaviour; but, as has been argued previously, a primary purpose of representation techniques should be to help auditors during their problem-solving activities. To be fair, flowcharts, prepared after the system behaviour has been determined by other means, do contribute to communication with reviewers and auditors in subsequent years; however, Peters (1981) and others as well, argue that there is little motivation for producing a complete and clear representation after the fact, making traditional flowcharts generally inaccurate and incomplete representations of system behaviour. To those who are accustomed to flowcharts, these criticisms may seem unfair. It may be that they do not apply to audit uses of flowcharts to the same degree as to

REPRESENTING DATABASE STRUCTURE: LOGICAL DATA STRUCTURES

Source: March, S.T. and J.V. Carlis, "A Computer-Aided Database Design Methodology" Working Paper, Minneapolis, MN: MIS Research Centre, University of Minnesota, September 1980.

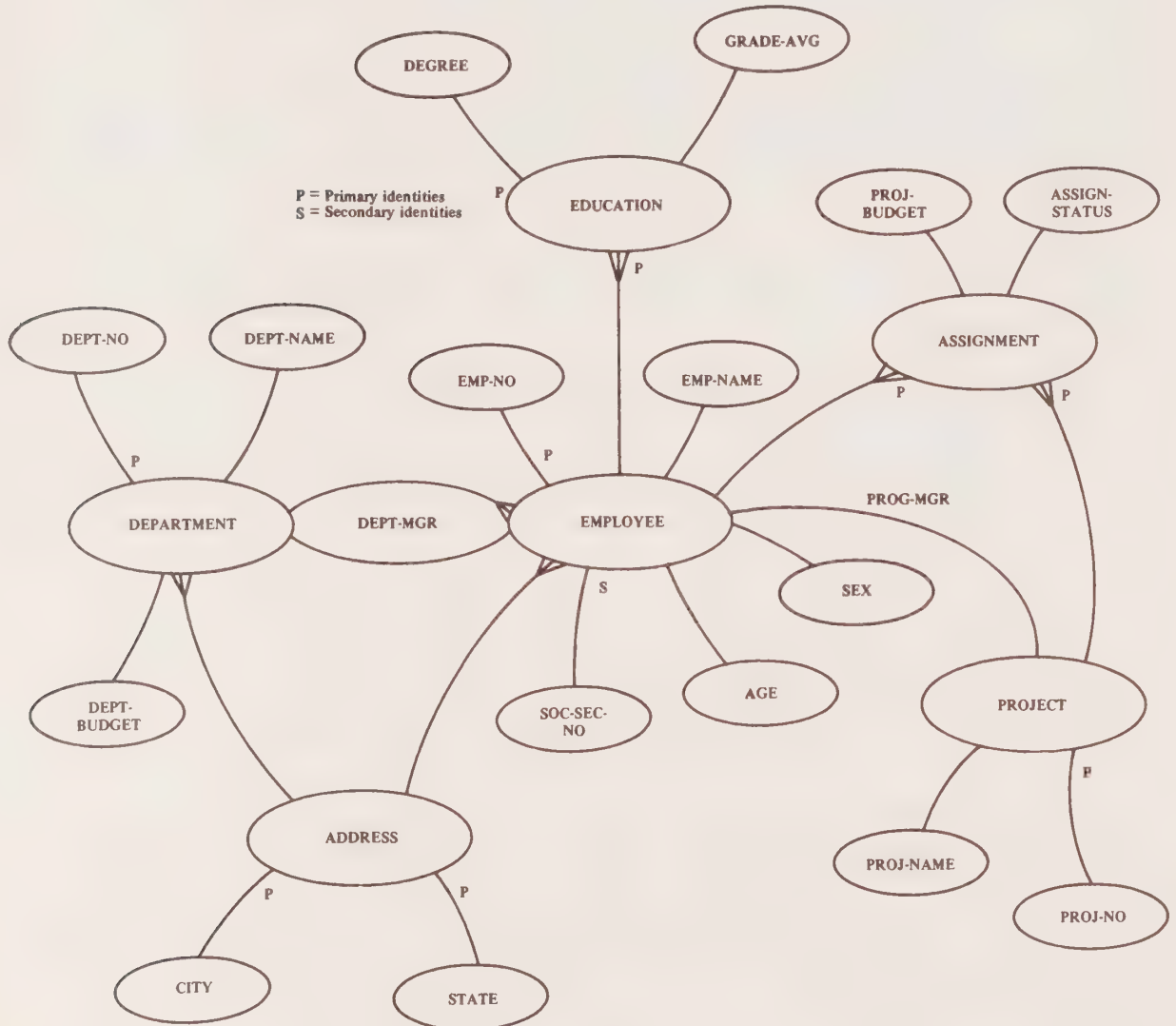


Figure 11

software development uses.²⁴ Programming theoreticians (e.g., Knuth, 1974) have shown that any program may be represented as an arrangement of the three simple structures, shown in Figure 12:

- a sequence (i.e., do part 1, part 2, part 3 . . . end do),
- an alternation (i.e., if . . . then . . . else . . . end if),
- an iteration (i.e., while . . . do . . . end while).

This arrangement is consistent with the argument presented earlier regarding reduction of complexity by taking advantage of the redundancy present in complex systems.

Some of the essential attributes of software behaviour representation schemes include:

- ability to represent data flows, data structures, control flows and control structures,
- forced simplification to the three basic constructs; i.e., sequence, iteration, alternation,
- distinction between physical and logical form; i.e., language free,
- explicit but clear depiction of nesting levels, highlighting the required conditions for a program segment to execute,
- real time effects/responses represented (as opposed to batch).

A number of techniques have been proposed for representing software behaviour, including: various forms of pseudocode, control graphs, decision tables, flowcharts and so on. Although several of these techniques might suggest useful adaptations for audit purposes in specific instances, no technique except perhaps pseudocode appears generally applicable.

²⁴ This is an empirically testable issue and requires some evidence to help resolve it. One thing is certain; the criticisms should not be rejected out-of-hand.

REPRESENTING SOFTWARE BEHAVIOUR: BASIC CONSTRUCTS

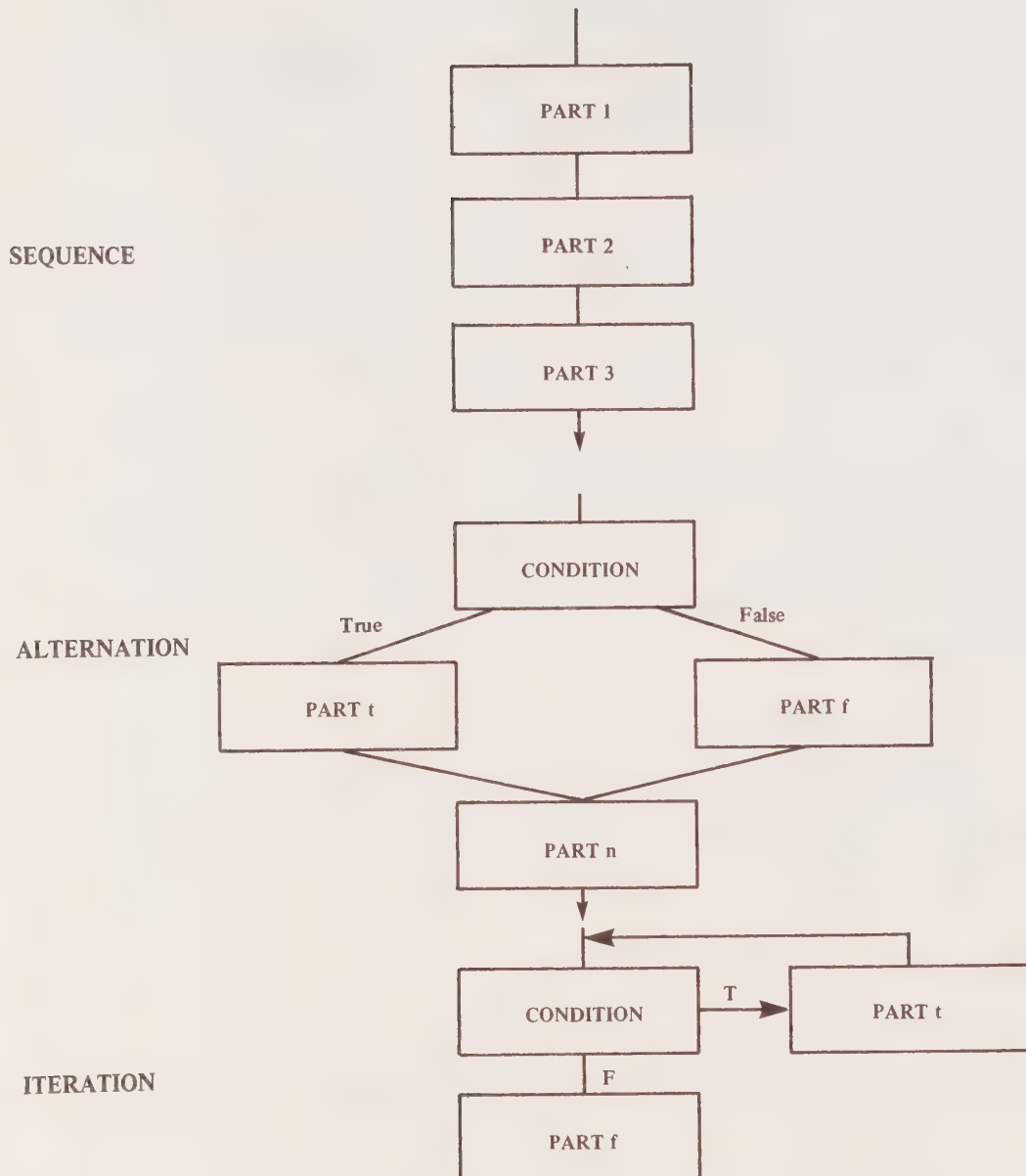


Figure 12

Information Evaluation Aids

Slovic and Fischhoff (1977) outlined a method designed to reduce hindsight bias in judgment formation. Under this method, auditors would be asked not only to explain why a given conclusion was drawn but also to explain the circumstances that would have led to an alternative conclusion; for example, not just how a control works but what circumstances would lead it to fail.

Koriat et al. (1980) suggested that requiring two lists of reasons, one supporting a given conclusion, the other supporting the opposite, can produce a marked improvement in the appropriateness of the amount of assurance (or confidence) expressed about a conclusion.

Boritz (1983a) adapted these suggestions in designing an internal control questionnaire (see Figure 13). The parallel organization of "yes" and "no" answers to specific points is intended to encourage careful weighing of those responses and considerations prior to making a global "YES" or "NO" judgment about an overall control objective.

Usually, after numerous items of information have been identified it becomes important to evaluate and combine them into a global judgment or decision. For this purpose there are essentially three categories of techniques which may be used to assist the problem-solver:

- graphical or tabular data presentations,
- management science models for synthesizing or aggregating data,
- humans for synthesizing and aggregating data (including expert systems).

Another possibility involves using a combination of these approaches.

EXCERPT FROM STRUCTURED INTERNAL CONTROL EVALUATION GUIDE

Source: Boritz (1985a)

CLIENT: Dominion Hardware
Wholesalers Limited

INTERNAL CONTROL EVALUATION GUIDE SALES, RECEIVABLES, RECEIPTS AUTHORIZATION OBJECTIVES

Only sales that meet management's authorized criteria, such as customer acceptability, credit worthiness, prices, delivery terms, and other terms of sales are accepted. YES NO

- | | | | |
|---|-----|-----|----|
| . Established policies and well-defined procedures for investigating credit worthiness of prospective customers. | n/a | yes | no |
| . Use of customer lists (or master files) approved by credit manager with adequate procedures for, and controls over, adding, changing, and deleting information from such lists (or master files) on a timely basis. | n/a | yes | no |
| . Well-defined criteria, procedures and responsibilities for approval and processing of customer orders. | n/a | yes | no |
| . Programmed procedures for checking validity of customers and terms prior to processing sales orders. | n/a | yes | no |
| . Adequate controls over program development and modification. | n/a | yes | no |

Sales prices, quantities and other terms conform to the authorization. YES NO

- | | | | |
|--|-----|-----|----|
| . Appropriate order entry forms (or video terminal screen layouts) used. | n/a | yes | no |
| . Approved current sales catalogs or standard price lists used. | n/a | yes | no |
| . Appropriate pre-programmed criteria used to adequately monitor and control order entry procedures. | n/a | yes | no |
| . All departures from established criteria (e.g., standard prices, terms, credit limits) require special approval. | n/a | yes | no |
| . All exceptions to pre-programmed criteria automatically logged and subsequently reviewed. | n/a | yes | no |
| . Periodic review of credit limits and other standing customer-related information. | n/a | yes | no |
| . Periodic independent check of sales order details against management's authorized criteria. | n/a | yes | no |

Sales related deductions and adjustments such as credits for return goods, services under a warranty, cash discounts, and sales commissions are properly authorized. YES NO

- | | | | |
|--|-----|-----|----|
| . Properly approved commission schedules used. | n/a | yes | no |
| . Adequate procedures for approval of bad debt write-offs. | n/a | yes | no |
| . Adequate procedures for handling goods returned for credit or warranty service. | n/a | yes | no |
| . Appropriate pre-programmed criteria used to adequately monitor and control entry of miscellaneous credit transactions. | n/a | yes | no |

Figure 13

Graphical Data Presentations

Recall that many of the judgmental biases discussed previously emphasized human weaknesses in properly treating multi-variate, covarying, cues. Cluster representations are one way of compensating, by representing the associated variables graphically. Although such diagrams are more readily prepared, given today's technology, for quantitative data, the concept merits consideration for qualitative data as well.

A particularly innovative technique for graphically representing multi-dimensional data (see Figure 14) was suggested by Chernoff (1973). Faces are constructed (manually or by computer) by assigning each variable of interest to a feature of a face (e.g., size of eyes, length of nose, etc.). Moriarity (1979) contended that schematic faces have particular potential because:

- people are familiar with faces so that they can easily distinguish change,
- the faces are rich enough in detail to represent a large number of variables,
- there is a good deal of psychological research indicating the saliency of various facial features, and these may provide a basis for assigning weights to features,
- technology for their construction is available and inexpensive.

A major weakness of the method might be its susceptibility to being underestimated in terms of its usefulness and effectiveness because of the cartoon-like faces that result. Even of greater significance is the dependence of the face-drawing technology upon a statistical model of the phenomena to be represented. Such models do not exist for most problems that auditors deal with and would need to be constructed.

Experienced or expert professionals often recognize clusters and patterns of cues without aids. These are part of their knowledge base. To the extent that cluster analysis and pattern recognition can be formalized, less expert auditors would benefit by improved ability to integrate cues or observations.

CHERNOFF FACES

Source: Moriarity (1979).

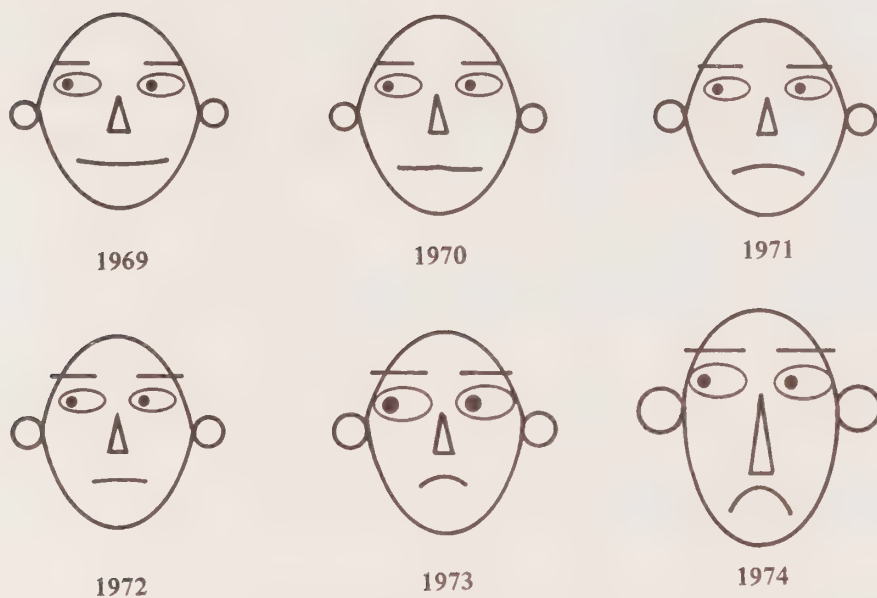


Figure 14

Ehrenberg (1977), as cited by Libby (1981), suggests that a good table should make patterns and exceptions obvious when the probable pattern is known beforehand. For example one auditing firm pre-specifies "critical" combinations of controls (absence/presence) which are used as control evaluation aids in a micro-computer-based decision table methodology (Deloitte, Haskins and Sells 1985).

Management Science Models

Linear programming: Linear programming is a mathematical method of determining an optimal solution that satisfies multiple objectives and numerous interrelated restrictions and constraints. A linear programming problem has three essential elements:

- alternative courses of action - there must be two or more controllable variables that must be handled simultaneously.
- constraints - the alternative courses of action or the variables of the model are interrelated through some type of restriction. Restrictions define the feasibility of a proposed course of action.
- objectives - there must exist a clear-cut criterion by which the relative merits of each of the alternative courses of action may be evaluated.

Linear programming may assist the auditor in ensuring that professional objectives are met subject to specified resource limitations. It allows flexibility by permitting numerous "what-if" kinds of operations through post-optimal analysis and does not require the planner to assign explicit weights to objectives.

Three basic assumptions (Trueman, 1974, p. 231) in a linear programming model are:

- proportionality (i.e., the amount of each resource used or requirement supplied) and the associated contribution to profit or cost must be exactly proportional to the value of each decision variable;
- additivity (i.e., the total amount of each resource utilized or requirement supplied) and the total profit or cost are equal to the sum of the respective amounts. The two foregoing assumptions mean that all constraints and objective functions are characterized by linear relationships;

- certainty (i.e., the linear programming model is completely deterministic, having no stochastic elements) is assumed.

Potential limitations of this technique are that objectives and criteria must be expressed in quantitative terms. The variables must be linearly related in terms of resource usage and objective contribution to the specified objectives.

Goal programming: Goal programming is a decision aid for solving problems with multi-conflicting objectives through the use of a system of priorities (Lee 1972, p. 22). Low-order objectives are considered only when high-order objectives are satisfied or have reached a point beyond which no further improvements are desired. Instead of trying to maximize or minimize the objective function directly, deviations from goals, given a set of constraints, are minimized. Goal-programming problems are always minimization problems. Deviations from the highest priority goal are minimized to the fullest possible extent, followed by the minimization of deviations from the next goal, and so on.

Goal programming shares the same assumptions as linear programming: proportionality, additivity and certainty. However, whereas linear programming optimizes one objective function, goal programming optimizes several conflicting objectives in the order of their importance. In linear programming, goals and sub-goals have to be quantified and reduced to one composite function, whereas in goal programming, this unidimensionality of the objective function is eliminated by treating goals and sub-goals separately.

In the linear-programming approach, the values of choice variables are dictated by the objective-function criterion and tend to "drive" the value of the slack variables, whereas in goal programming, deviational variations "drive" the values of the choice variables. In linear programming, the relationships of the variables are expressed using cardinal numbers. In goal programming, sub-goals may be stated in terms of upper or lower limits. Further information is provided in Boritz (1983b).

The primary advantage of goal programming is that it increases the dimensions of the objective function by accommodating multi-conflicting objectives; for example, Weeling (1977) applied the technique to the analysis and reconciliation of conflicting objectives of job productivity, human-resource development and individual satisfaction.

In summary, it is a flexible technique for decision problems that involve conflicting objectives, allows for an ordinal solution (Lee 1972, p. 22), and satisfies goals in their order of importance. It does not require that all goals be expressed in monetary terms or that they be reduced to a composite function. However, the variables must be linearly related in terms of resource usage and contribution to the specified objectives. The process of deriving the optimal solution is complicated and time-consuming and requires computer aids.

Humans as Synthesizers

Some problems are so complex that management science models simply cannot solve them within any reasonable time frame. They require human expertise because, despite limitations of cognitive processes, there are human experts who have found ways of successfully solving complex problems. There are essentially three approaches which may be used:

- consult with a single human expert (e.g., a consultant),
- consult a number of human experts and then aggregate their opinions,
- rely on expert systems.

Solomon (1982) studied probability assessments by individual auditors and audit teams (i.e., involving some degree of face-to-face interaction) as well as comparing human teams against "mathematically" formed teams (i.e., combining responses from non-interacting individuals into summaries as if they were done by groups). He found that the prior probabilities assessed by audit teams were more extreme and exhibited greater consensus;²⁵ however, they were also less accurate than individual judgments. The comparison of interacting teams against statistically combined judgments to represent non-interacting group judgments indicated that interacting teams outperformed the statistically formed "groups".

25 This is consistent with findings by Reckers and Schultz (1982). In addition, Reckers and Schultz found that interacting groups had greater confidence in their judgments (although this may be 'false' confidence).

The problems to be solved are many, but human experts are few. It is not always possible to find a human expert to act as a consultant in a difficult problem area. This accounts for the current emphasis on research into expert systems, since a single expert system can be used by many interested parties. Expert systems are discussed in Section Three of this chapter. While their applications to auditing are only now being explored, they hold great promise.

SECTION THREE: DECISION SUPPORT AND EXPERT SYSTEMS

Complex networks of semi-structured tasks represent an ideal setting for the implementation of decision support systems (DSS). Johnson et al. (1979) suggest that through the use of decision support systems it is possible to transfer certain capabilities from those who have them to those who do not. Within the context of such support systems, specific techniques for enhancing information search and problem-structuring would play prominent roles. The goal of DSS and expert systems would be to help less expert professionals (e.g., students, trainees, etc.) to improve the quality of their judgments and decisions, and eventually, to improve their general problem-solving skills as well. In addition, these systems could serve to enhance communications; e.g., between the person who does the initial work and the various subsequent reviewers.

In keeping with the foregoing discussion of assisted professional problem-solving, a decision support system could:

- help structure and focus the professional's cognitive image of the problem by incorporating strategies for (a) generating and pruning lists of hypotheses, and (b) grouping and organizing information;
- permit novices to mimic experts (within a certain range) by providing guidelines on problem-solving strategies;
- provide the planning knowledge necessary for guiding the diagnostic process from beginning to end to help avoid or minimize premature conclusions, biased interpretations and judgments, and incorrect inferences;
- provide an organized database to extend specific case knowledge to permit improved lines of reasoning to be used; and,
- simplify evaluation processes to help avoid faulty combinational systems.

Automated Decision Support Systems

There is no single widely accepted definition for decision support systems. Scott Morton (1971) defined "management decision systems" as, "interactive computer-based systems, which help decision-makers utilize data and models to solve unstructured problems". Keen and Scott Morton (1978) pointed out:

...semi-structured tasks, is where DSS can be the most effective. These are decisions where managerial judgment alone will not be adequate, perhaps because of the size of the problem or the computational complexity and precision needed to solve it. On the other hand, the model or data alone are also inadequate because the solution involves some judgment and subjective analysis. Under these conditions the manager plus the system can provide a more effective solution than either alone. (p. 86)

Successful DSS, by bringing structure to at least part of managerial decision-making processes, shift the line dividing structured from unstructured problems so as to encompass more in the former domain. To this end some systems primarily store and retrieve data, and they leave to the user the important procedural aspects of decision-making. Others embody decision-making algorithms but leave to the user the task of collecting and distilling the data that must be provided for these algorithms. (p. 205)

Sprague (1980, p. 5) stated the broad "charter" for decision support systems:

Dedicated to improving the performance of knowledge workers in organizations through the application of information technology.

However, Alter (1977, p. 49), referred to decision support systems as a "buzzword whose time has arrived".

Alavi (1982) conducted in-depth interviews with senior-level executives who had no previous exposure to decision support systems. They were primarily concerned with handling conflicting objectives or criteria and making decisions on the basis of insufficient information. It was to these needs that they felt DSS could best contribute.

Bonczek et al. (1981) described a computer-based decision support system developed for Xerox corporate planning (refer also to Seaberg and Seaberg 1973). This system was based on the following premise:

...that it is possible formally and theoretically to describe the management process, that the resultant models can be programmed, and that a combined "man-model-machine" system can be used to make better decisions than could be made without the support of management science and computer science. (p. 52)

The advantages of such an approach, reportedly achieved by Xerox, were summarized as follows:

- drastic reduction of analyst time to 1/8 of that previously required to manipulate data,
- increased accuracy,
- better specified forecasting logic to eliminate non-standard (and presumably less defensible) procedures,
- drastic reduction in time required to generate plans,
- internal consistency of data despite last-minute adjustments, and
- increased availability of time for concentrating on analysis.

As discussed previously, the major goal of decision support is to transfer capabilities from those who have them (either individually or as groups) to those who do not. Within the context of such support systems, emphasis is placed upon specific techniques for enhancing information search and problem structuring behaviour. Keen and Scott Morton (1978, p. 2) described DSS as follows:

- the impact is on decisions in which there is sufficient structure for computer and analytic aids to be of value but where managers' judgment is essential,
- the payoff is in extending the range and capability of managers' decision process to help them improve their effectiveness,
- the relevance for managers is the creation of a supportive tool under their own control, which does not attempt to automate the decision process, predefine objectives or impose solutions.

The primary goal of such systems is to improve the quality of judgments and decisions. They may not, however, be equally effective at improving the DSS-independent problem-solving skills of their users. This may be an extremely grave consequence associated with DSS/expert systems and should be considered.

Sprague (1980) specified a set of six capabilities or performance requirements for such systems. The first three pertain to the decision-making tasks, while the latter three pertain to the support mechanisms. Thus, a DSS should provide support for:

- decision-making, but with emphasis on semi-structured and unstructured decisions,
- users at all levels, assisting in integration between the levels wherever appropriate,
- decisions which are interdependent as well as those that are independent,
- all phases of the decision-making process; i.e., goal formulation, information gathering, analysis, and action/choice,
- a variety of decision-making processes, but not be dependent on any one; i.e., it should be "user driven", and
- ease of use.

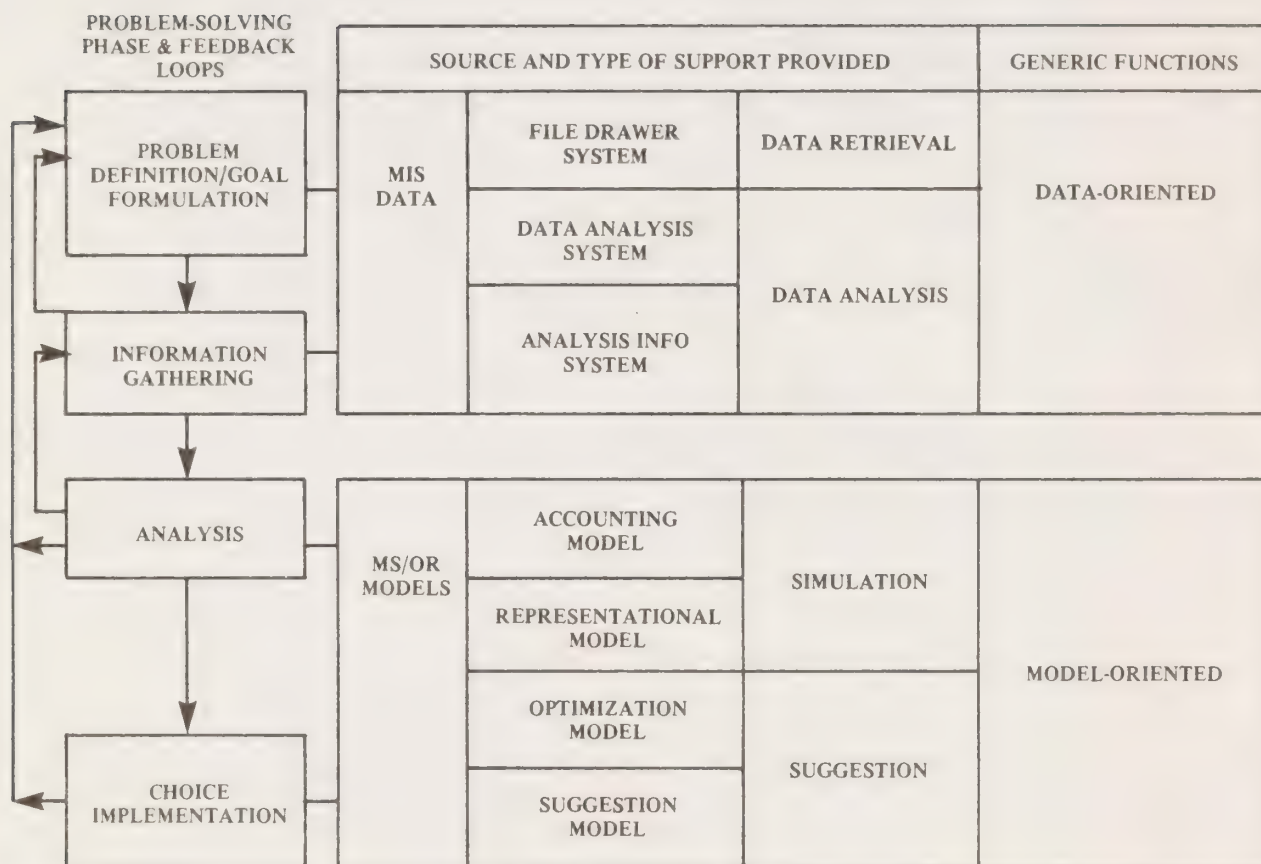
Alter (1980) identified the following six generic operations for decision support systems:

- retrieve a single item of information,
- perform ad hoc data analysis,
- produce standard reports,
- estimate consequences of proposed decisions,
- propose decisions, and
- make decisions.

He ultimately grouped these into data-oriented and model-oriented functions (refer to Figure 15).

Note that the foregoing objectives and principles are quite general and do not include specific technical implementation considerations. However, Johnson et al. (1979) emphasize that the foremost criterion for evaluating any decision support system is its acceptability and actual use, and these depend upon the developer's success in actually achieving the following objectives:

PHASES OF DECISION-MAKING AND DECISION SUPPORT BUILDING BLOCKS



LEGEND:

MIS = MANAGEMENT INFORMATION SYSTEM
MS/OR = MANAGEMENT SCIENCE/OPERATIONS RESEARCH
DSS = DECISION SUPPORT SYSTEM

Figure 15

- A. Content
 - 1. relevance - right information provided,
 - 2. availability - right information provided at the right time,
 - 3. specificity - information presented at the right level of detail, and
 - 4. justification - information presented for the right reasons.
- B. Processing
 - 1. accessibility - flexible access to and retrieval of information, and
 - 2. efficiency - small user workspace required in interaction between user and system.
- C. Delivery
 - 1. comprehensibility - form known and acceptable to user,
 - 2. saliency - focus on important information, and
 - 3. useability - satisfy broad range of human-factors requirements.

Mock and Vertinsky (1985) emphasize several additional concerns that DSS builders must take into account:

- nature of the decision process,
- resources and constraints which govern the behaviour of the intended users,
- motivations of the intended users to use or misuse the system, and
- organizational and environmental constraints (e.g., privacy, security, other statutory requests) to be satisfied.

Examples of Decision Support Systems

Although there have been great strides made to automate various aspects of auditing,²⁶ few audit decision support systems currently exist. Most of the systems which do exist are either preliminary versions or are still under development; for example:

26 For example, wide use is made of computer-assisted and statistical auditing techniques, automated audit working paper preparation systems, and spread-sheet packages.

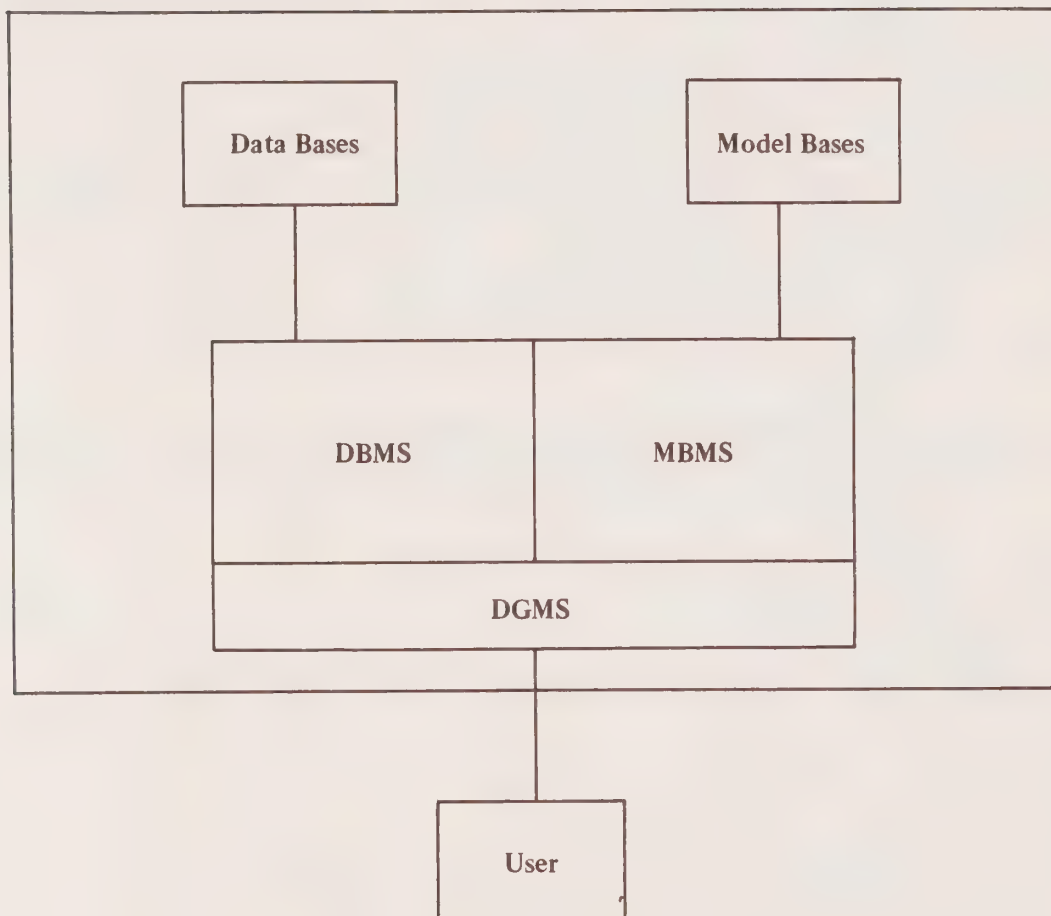
- TICOM is a system for modelling an internal control system and then questioning the model for purposes of evaluating internal controls (Bailey et al. 1985). Using this system the control evaluation can be more rigorous and exhaustive, and the documentation can be more thorough than with conventional techniques.
- CONTROL PLAN was developed by the accounting firm of Deloitte, Haskins and Sells (1985) to help an auditor record and evaluate features of client internal control systems. This microcomputer program compares pre-defined conditions that may exist within accounting and control systems against actual descriptive data entered by an auditor. This comparison can help the auditor determine whether conditions exist (alone or in combination with other conditions) to indicate specific potential control weaknesses.
- CAPS is a computerized audit planning and risk analysis system (Boritz 1984). It permits directors of internal audit departments to identify risk factors which would be useful to prioritize audit units, evaluate their relative importance, set priorities within audit units and create long-term audit coverage plans.
- ABC AUDIT PLANNER is an audit testing support system (Boritz 1985b). It permits an auditor to enter financial statement data, estimate or compute materiality and precision, evaluate overall audit risk, plan audit procedures by financial statement item by assertion, and compute sample size requirements if statistical samples are planned.

Examples of decision support systems in other fields may be found in Decision Support Systems by Keen and Scott Morton (1978).

Anatomy of a DSS

Sprague (1980, p. 15) shows the general functional components of a decision support system, (see Figure 16) including:

A CONCEPTUAL MODEL OF A DECISION SUPPORT SYSTEM



Legend: **DBMS:** Data Base Management System
 MBMS: Model Base Management System
 DGMS: Dialogue Generation Management System

Figure 16

Databases: the data files that are stored in the computer. These files could be any combination of the following:

- "live" transactions files generated by the organization's day-to-day activities,
- databases created for the application of the specific decision support systems,
- databases purchased from outside the organization.

Database management software (DBMS): the programs that "manage" the databases, including:

- combining a variety of data sources through a data capture and extraction process,
- adding and deleting data quickly and easily,
- portraying logical data structures in user terms, and
- handling the user's data inquiry requests.

Model bases: the various models (programs) that can retrieve, aggregate, and/or analyze the existing databases and/or additional inputted data. Some of these models allow the user to perform "what-if" analyses; i.e., the user can change the values of some variables to determine their impact or the model's sensitivity.

Model base management software (MBMS): programs, similar to the DBMS, that "manage" the model bases similar to the DBMS, including:

- cataloging and maintaining a wide range of models, supporting all levels of management,
- creating new models quickly and easily, and
- interrelating these models with appropriate linkage through the databases.

Dialogue generation and management software (DGMS): the programs that provide the interface between the users and the system, including:

- what the user "sees" (based on the display or presentation language),
- what the user can do (based on the action language), and
- what the user must know (the required user knowledge base).

The DGMS should:

- handle a variety of dialogue styles,
- shift among the dialogue styles according to the user's choice,
- accommodate user actions in a variety of media,
- present data in a variety of formats and media, and
- provide flexible support for the user's knowledge base.

Relationship of Decision Support Systems, Computers, Management Information Systems and Management Science/Operations Research

Although a decision support system could exist as a manual system, most researchers view decision support systems as computerized systems. Alter (1977, p. 40) classified business computer applications into electronic data processing (EDP) systems and decision support systems, where:

- EDP systems are designed to automate or expedite transaction processing, record keeping, and business reporting. EDP systems emphasize clerical activities and are designed for processing efficiency. Data input and resulting output reports are performed on a relatively structured schedule.
- Decision support systems are designed to aid decision-making and decision implementation. Decision support systems are for management and planning activities and are designed more toward overall effectiveness. The output of decision support systems is more on an on-demand basis.

In a given organization it may be difficult to distinguish the EDP system and decision support systems. Both may share the same computer and some of the same files (databases) and report generators.

According to Keen (quoted by Bedard et al. 1983, p. 7):

Some researchers view decision support systems as a subfield of MIS, while others regard it as an extension of Management Science techniques. The former see Decision Support as providing managers with access to data and the latter as giving them access to analytic models.

Although the two concepts seem to overlap to some degree and Management Information Systems (MIS) predates DSS, Sprague (1980, p. 7) states that:

Decision support systems are not merely an evolutionary advancement of EDP and MIS, and they will certainly not replace either . . . Nor is it. . . aimed exclusively at top management. . . It is, rather, another powerful weapon in the information technology arsenal, aimed at improving the effectiveness of managers. . .

During the "golden years" of MIS (Naylor 1982) which continued to the early 1970s, some people envisioned a computer terminal available to every top executive. At minimum the executive could instantly make enquiries about the status of various aspects of the company such as sales trends for a particular product or the productivity of a particular manufacturing plant. Some foresaw even more sophisticated uses for DSS. For example, when faced with a problem, an executive would input the problem (in English) into the computer via the terminal and the computer would, in turn, present a suggested solution to the executive who would evaluate it and then take action.

As previously described, the DSS framework would incorporate both MIS and Management Science/Operations Research (MS/OR). MIS is responsible for the information gathering and management phase, while MS/OR provide the models for enhancing the action choice phase. In addition, Sprague touches on the potential for incorporating elements drawn from artificial intelligence (AI) research into DSS; i.e., expert systems.

Some pitfalls may be present for expert systems and DSS. A great deal of disenchantment followed MIS's enthusiastic introduction when MIS failed to perform as expected. Sprague (1980) addressed this concern when he stated:

The only hope for avoiding this wide swing in expectations is a realistic appraisal of what the decision support systems concept is, and what it can do.

Naylor (1982) criticizes the entire DSS field asserting that:

It exists primarily in the minds of academic visionaries and overly aggressive sales and marketing people. (p. 94)

Sprague (1980) warns of "technology pushers" who concentrate on seeking problems which are susceptible to the tools they know how to use.

Relationship of Decision Support Systems and Expert Systems

Bonczek et al. (1981) conclude that decision support systems can be classified in a two-dimensional space (refer to Figure 17), where one dimension (e.g., the x-axis) represents the method used for directing data retrieval and the other dimension (e.g., the y-axis) represents the method used for directing computational procedures. The origin of the axes represents systems where the user states the retrieval procedure or computational procedures explicitly. The extreme positions of both axes involve a statement of the problem by the user rather than a definition of the problem-solving procedure.

Needless to say, most (current) decision support systems fall in the mid-ranges of the graph. Here the user must specify what information is to be produced or which models are to be applied, but does not need to specify the detailed procedures to be used for retrieving the information or applying the models. As one moves to the extreme (northeast) positions represented by the axes in Figure 17, one enters the realm of expert systems.

Expert Systems

Expert systems are computer programs which emulate the problem-solving knowledge and skill of human experts. According to Feigenbaum (quoted by Gevarter, 1982, p. 2):

CLASSIFICATION OF DSS

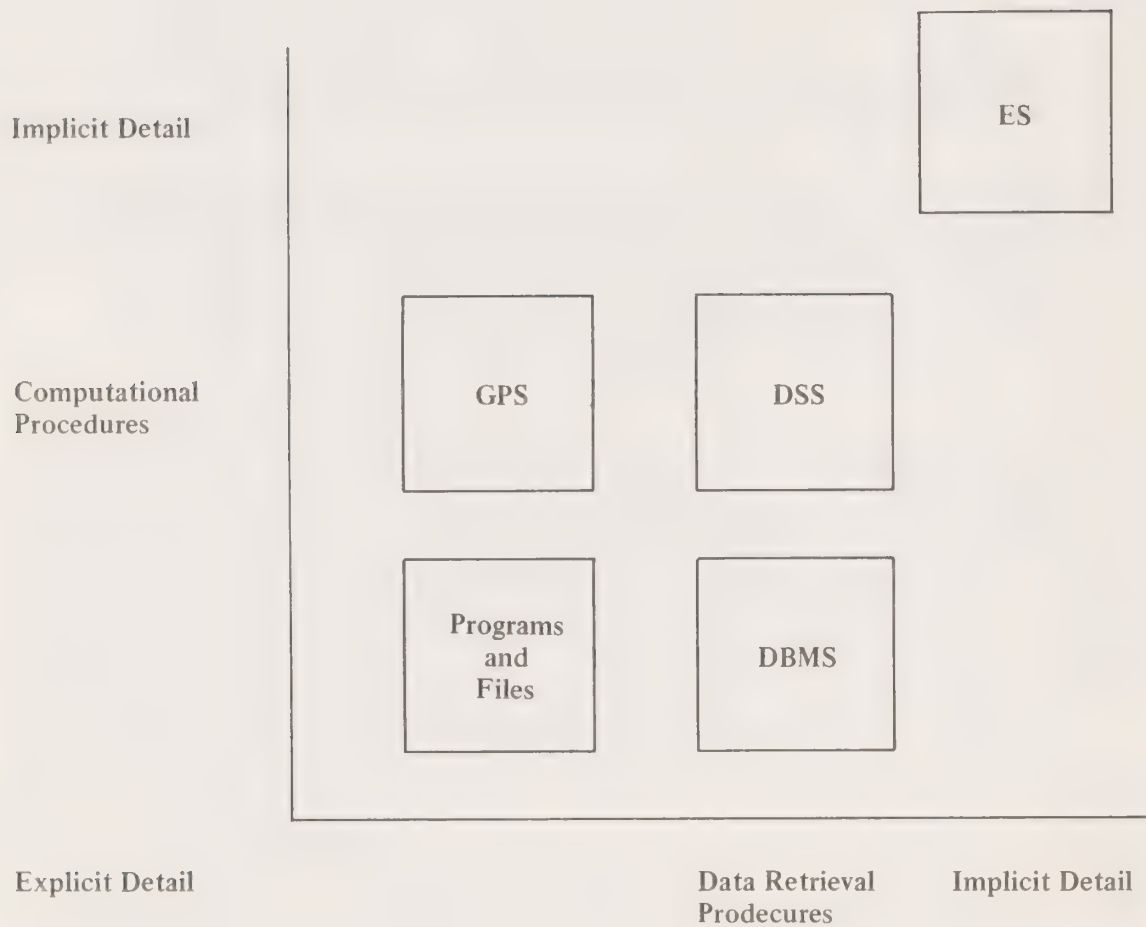


Figure 17

An "expert system" is an intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solution. The knowledge necessary to perform at such a level, plus the inference procedures used, can be thought of as a model of the expertise of the best Practitioners of the field.

The knowledge of an expert system consists of facts and heuristics. The "facts" constitute a body of information that is widely shared, publicly available, and generally agreed upon by experts in a field. The "heuristics" are mostly private, little-discussed rules of good judgment (rules of plausible reasoning, rules of good guessing) that characterize expert-level decision making in the field. The performance level of an expert system is primarily a function of the size and quality of the knowledge base that it possesses.

In the past, expert systems were only known to computer scientists engaged in artificial intelligence (AI) research; but recently, they have been popularized (e.g., refer to Feigenbaum and McCorduck 1984, Longair 1983, Alexander 1982, Webster and Miner 1982). In fact, the terms "expert system" and "decision support system" are used quite casually these days, particularly in software product advertisements.

In the 70's, it became apparent that database search strategies alone, even augmented by heuristic evaluation functions, were often inadequate to solve real world problems. The complexity of these problems was usually such that either (1) a combinatorial explosion occurred that defied reasonable search times, or (2) the ability to generate a suitable search space did not exist. In fact, it became apparent that for many problems, expert domain knowledge was even more important than the search strategy (or inference procedure). This realization led to the field of "Knowledge Engineering", which focuses on ways to bring expert knowledge to bear on problem solving. The resultant expert systems technology, limited to academic laboratories in the 70's, is now becoming cost-effective and is beginning to enter into commercial applications. (Gevarter, 1982 p. 1)

In The Dragons of Eden Sagan (1977, p. 236) has commented that, "The next major structural development in human intelligence is likely to be a partnership between intelligent humans and intelligent machines." More specifically, he asserts that "in reasonably restricted contexts the human use of artificial intelligence seems to be one of the two practicable major advances in human intelligence available in the near future" (p. 222).

A fundamental issue in expert system development is whether the problem requires expertise. As noted earlier, decision-making may involve problems that are highly structured or highly unstructured. Highly structured problems are often subject to algorithmic solutions such as those proposed by management scientists. Less well-structured problems typically do not have algorithmic solutions. Instead, the solutions often depend on heuristics developed through years of study and experience -- in short, expertise.

Hayes-Roth et al (1985) say that, "...the problem should be nontrivial but tractable, with promising avenues for incremental expansion". Hayes-Roth et al. (1983, p. 14) summarize 10 generic tasks requiring expertise, hence providing opportunities for expert system applications (refer to Table 3).

Expertise enters into the execution of these tasks as a result of the expert being exposed to numerous instances of a particular problem and learning how to perform these tasks well. For example, a physician's expertise arises from, "the large collection of empirical associations he or she accumulates by virtue of experience in the field" (Davis 1982, p. 4); i.e., an expert physician learns rules or heuristics over time about a particular disease(s) by being exposed to numerous cases.

The range of behaviours exhibited by human experts carries implications for some of the engineering principles used in expert systems, as well as providing a standard against which the behaviour of expert systems could be evaluated. According to Davis (1982) experts do the following:

- discover that a problem exists,
- structure ill-structured problems,
- solve problems,
- explain the result or the method used to obtain it,
- learn from the case,
- restructure their knowledge,
- change or break rules when necessary, and
- get help when needed.

Table 3
Tasks requiring Expertise

| Task | Problem Addressed |
|----------------|--|
| Interpretation | Inferring situation descriptions from sensor data |
| Prediction | Inferring likely consequences of given situations |
| Diagnosis | Inferring system malfunctions from observables |
| Design | Configuring objects under constraints |
| Planning | Designing actions |
| Monitoring | Comparing observations to plan vulnerabilities |
| Debugging | Prescribing remedies for malfunctions |
| Repair | Executing a plan to administer a prescribed remedy |
| Instruction | Diagnosing, debugging and repairing student behaviour |
| Control | Interpreting, predicting, repairing and monitoring system behaviours |

Source: Hayes-Roth et al. (1984, p. 14)

No expert system in existence today can fulfil such stringent requirements; however, as demonstrated below, existing expert systems have achieved significant levels of performance.

Examples of Expert Systems

- MYCIN was developed by Shortliffe (1976) for diagnosis of infectious diseases, particularly blood infections and meningitis infections and for prescribing treatment. MYCIN uses a four-stage decision process. First the system determines if the patient's condition, caused by bacteria, is critical. Secondly, based on the clinical information and the preliminary results of the culture, it identifies the organism. In the third stage, it considers potentially useful drugs, and finally, it recommends the best drug for this particular patient.
- PROSPECTOR is another well-known system that was developed to aid geologists in the exploration for different kinds of ore deposits. Like MYCIN, the system gives the rationale for its conclusions and certainty (degree of confidence) factor. Some comparisons between the system and the human expert have resulted in an accuracy within seven per cent of the human expert. In addition, the system has also identified the location of a previously unknown high-grade ore deposit.
- XCON (formerly, RI) configures customer requests for VAX computer systems at Digital Equipment Corporation. XCON's input is a customer's order, and its output is a set of diagrams displaying the spatial relationships among the components on the order. These diagrams are used by the technicians who physically assemble the system (Harmon and King 1985, p. 155).
- DENDRAL is a chemistry expert system which supports hundreds of international users daily in chemical structure elucidation from mass spectra data (Hayes-Roth et al. 1983, p. 6).
- INTERNIST/CADUCEUS is the most knowledge-intensive expert system in existence. It embodies more knowledge of internal medicine than any human and can correctly diagnose complex test cases that stymie human experts.

"It covers more than 80% of all internal medicine; its knowledge base encompasses about 500 diseases and more than 3,500 manifestations of disease." (Feigenbaum and McCorduck 1984, p. 68.)

- PUFF integrates knowledge of pulmonary function disease with a previously developed domain-independent expert system for diagnostic consultations and now provides expert analyses at a California medical centre (Hayes-Roth et al. 1983, p. 6).

In accounting and auditing, some systems have also been developed, or are being developed, that use a MYCIN or PROSPECTOR inference system. They include TAXADVISOR (Michaelson 1984), AUDITOR (Dungan and Chandler 1985), and EDP AUDITOR (Hansen and Messier 1983).

- TAXADVISOR is an individual income and transfer tax planning system that makes recommendations on the client's estate investment portfolio to maximize approximately the wealth transferred by the client at death. The system was evaluated by two experts from public accounting firms and was found to perform as well as tax experts.
- AUDITOR is a program that assesses the adequacy of a client's allowance for bad debts. The system was evaluated by comparing its decision with an expert for 11 real world cases. Agreement between the two was 91 per cent.
- EDP AUDITOR is a knowledge-based expert system that assists the auditor in the evaluation of the computer controls in a computer environment. The system is based on ALX which is expert system software developed from the PROSPECTOR system. EDP AUDITOR is still in its early developmental stage and consequently has not been validated.

Anatomy of Expert Systems

Bonczek et al. (1981) identify three principal components of decision support/expert systems:

- a language system,
- a knowledge system, and
- a problem-processing system.

A language system may encompass both data retrieval languages and computational languages but is not concerned with the interfacing of models and data. It is a means of communication between that user and the DSS. A knowledge system contains knowledge about the user's problem domain, which may include both facts and rules for using facts, represented in such a way as to be accessible by the problem-processing system. The problem-processing system may be viewed as the interfacing mechanism between the knowledge system and the user's problem expressed via the language system, (also called inference procedure/engine). The key elements of an expert DSS are diagrammed in Figure 18:

- the external environment of the system, including in particular, the knowledge domain of interest,
- the knowledge base of the system, consisting of two main components; i.e., (i) domain-specific facts and (ii) heuristics, the set of procedures for solving problems in the domain by using the facts,
- the expert problem-processing program which guides the use of facts and problem-solving (also called the inference engine or rule interpreter),
- the language system interface whereby the human user interacts with (the system developer via) the expert program,
- the human user who utilizes the expert system for enhancing judgment and amplifying problem-solving skills, and who perhaps provides new information to the system.

In the background are the equipment, software (i.e., language) and media for developing and operating the expert system. In the background as well is the system developer (the knowledge engineer) who gathers and analyzes information, codes and physically controls the functions of the expert system.

COMPONENTS OF EXPERT SYSTEMS

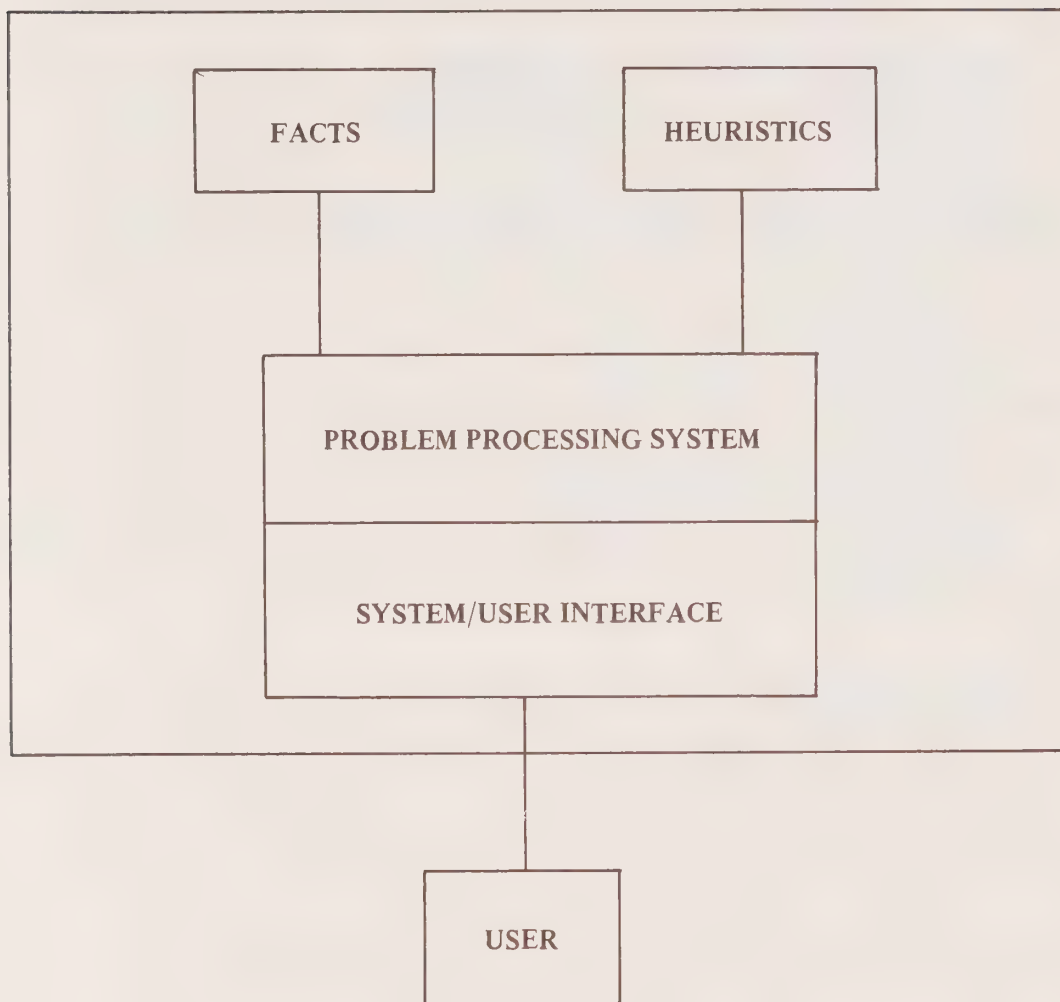


Figure 18

According to Gevarter (1982), there are three different user-modes for an expert system in contrast to the single mode (getting answers to problems) characteristic of the more familiar type of computing:

- getting answers to problems -- user as client,
- improving or increasing the system's knowledge -- user as tutor, and
- harvesting the knowledge base for human use -- user as pupil.

An expert system acts over time as a systematizing repository of the knowledge accumulated by many specialists of diverse experience. Hence, it can ultimately attain a level of consultant expertise exceeding that of any single one of its "tutors".

An expert system differs from conventional computer programs (Duda 1981, p. 242).

...There is a clear separation of general knowledge about the problem (the rules forming a knowledge base) from information about the current problem (the input data) and methods for applying the general knowledge to the problem (the rule interpreter).

In a conventional computer program, knowledge pertinent to the problem and methods for utilizing this knowledge are all intermixed, so that it is difficult to change the program. In an expert system the program itself is only an interpreter (or general reasoning mechanism) and, ideally, the system can be changed by simply adding or subtracting rules in the knowledge base.

Concluding Remarks about Decision Support and Expert Systems

Because the entire field of expert systems research and development is in a rapid process of evolution, speculating about the ultimate capabilities of such systems is not a very useful exercise. However, several points are noteworthy.

- In general, the poorer the structure of a task environment, the more valuable the judgment of an expert, even if the expert is merely a series of computer-coded productions (i.e., (if...then) statements of fact, and/or problem-solving tactics or heuristics). Gorry and Krumland (1983) emphasize the role of DSS in structuring ill-structured problems. Expert systems are an extension of this structuring activity.

- Expert systems generally focus upon relatively narrow problem domains rather than embodying expertise of a general or multi-purpose nature. For example, MYCIN is restricted to the diagnosis of meningitis. PROSPECTOR is restricted to the evaluation of ore-deposits. Of course, there is no reason other than feasibility that a number of such systems should not be connected; one "piping" its output to become another's input.
- Expert systems depend critically upon the existence and identification of computer-codifiable expertise in the problem domain, as well as on the existence and application of appropriate expert system development tools and methods for eliciting, representing, coding and subsequently accessing the expertise. Neither of these pre-requisites should be taken for granted; i.e., identifiable expertise may not exist and/or the tools for representing may not be available.
- Expert systems are not value-free. Their widespread adoption and proliferation carries both payoffs and penalties; but, the latter are hardly ever discussed. For example, once an expert system is created and put into use, where will the next generation of expert human come from? On the other hand, such systems can take over the human consultant's role in a decision task, making the expert system itself a reliable and extremely powerful part of a larger decision support network, aimed at expanding the problem-solving capabilities of an organization, a team, or an individual.

The field of auditing is currently undergoing rapid technological change. The use of quantitative models is expanding. Associated with their growth is an increased emphasis on the use of computer-assisted tools and techniques for automating a variety of diverse audit tasks and amplifying the problem-solving capacity of audit professionals. Although by no means the only, or even necessarily, the most significant developments in the audit profession, the trends towards decision-support and expert systems are evidenced by the large sums of money being invested in these facilities by all the major public accounting firms, several governmental bodies and professional associations.

It is difficult to imagine what the character of the auditing profession will be like when these tools become widely available and used. It appears certain, however, that we are at the forefront of a great wave of automated decision support systems aimed at enhancing virtually all aspects of audit activity. This suggests that many corresponding changes will be required on the human front. In some cases, jobs will be eliminated. In others, jobs will be enriched through the interaction of auditors and decision-support/expert systems. Hopefully, the quality of auditing will be improved as a result. We shall see.

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Appendix A

THE KNOWLEDGE ENGINEER AT WORK

(Excerpted from The Fifth Generation, Feigenbaum and McCorduck, 1984, pp. 87-89.)

First, of course, she must persuade a human expert to agree to devote the considerable time it will take to have his mind mined. Experts, by their nature, are busy people, constantly being called upon to do just one more thing. But for a variety of reasons, experts can be persuaded to participate, and so the project begins. Once Nii has secured the expert's cooperation, she immerses herself in his field, reading college textbooks, articles, and other background material, in part to understand what the field is about, and in part to pick up the jargon that pervades every field. Now she is ready for the first interview.

At the beginning, she asks the expert to describe what he thinks he does, and she also asks him to think about how he solves problems. She urges him to choose a fairly difficult problem to examine. Nothing makes everybody lose interest faster than an easy problem, and furthermore, an easy problem reveals little that's significant about someone's expertise. Nii's guideline is that although the problem under consideration should be nontrivial, it shouldn't be too hard, either. She generally prefers problems that will take humans a few hours to solve, because if a problem takes days to be solved by a human, it's probably too difficult or ill-defined to be engineered into an expert program using current AI techniques.

Having collected this initial information, she brings it back to the other members of the team, the programmers. Though the programmers do the actual coding, it's up to the knowledge engineer to choose which of several available problem-solving frameworks inference procedures -- best suits the new domain. The programmers must get a first version up and running in a few days. Strangely enough, those first few days (as opposed to weeks) are critical psychologically for hooking the expert into the project. Experts, even as the rest of us, like their gratification sooner rather than later and are much likelier to continue to commit that precious resource, time, to a project they can see is making progress.

Of course, there are likely to be major flaws in the first version of the expert system. Perhaps the expert hasn't really articulated very well what he does. Perhaps he's been misunderstood. Perhaps -- and this is often the case -- the method he has claimed to use is a textbook fiction and has very little to do with his practice in the real world. He groans as he sees the program on display before him: "Not that way," he says.

"Then how?" Nii asks. "Where did we go wrong?"

But if he couldn't articulate it at first, perhaps he's no better at it now. Thus Nii asks him to talk his way through the model problem, verbalizing each step as he goes. This time, she observes, is usually very different from the textbook version he first gave of his problem-solving techniques.

She watches him carefully. Sometimes he says he relies on data that in fact his eyes never come to rest on, or maybe she sees he uses them at a different stage from the one he says he does. All this must be integrated into a new, amended version of the expert system and brought back to the expert to validate or correct before his interest strays elsewhere.

Nii says that during the interviews she is not necessarily listening to the facts the expert gives her so much as how he manipulates his knowledge. As he talks, she is systematically evaluating mentally the various AI knowledge representation and inference methods -- object oriented techniques, blackboard techniques, production rules, to name a few -- seeing how well one or any of them matches the expert's behaviour. She asks questions: "Would this make sense?" "Can you do it that way?" These are not only to extract more knowledge from the expert, but also to test the model of his work she's building up in her own mind. Moreover, she has to determine whether this expert is special in his interpretations and assumptions, or whether there's uniform agreement in his field. When she compares his knowledge to textbook knowledge, she usually discovers that the textbook is so general it's nearly useless. Typically, an expert confronted with a textbook assertion will say: "That's true, but if you see enough patients/rocks/chip designs/instrument readings, you see that it isn't true after all. At this point, knowledge threatens to become ten thousand special cases.

There is, in addition, the problem of keeping the expert focused during the interview -- even the minds of experts will wander. One of Nii's tricks is to concentrate on the specific problem she has asked the expert to provide, the model problem that will not only keep everybody's interest lively, but will also serve as a good test for her own model of how thinking in the field is shaped. All these processes are repeated day after day, the expert being continuously presented with an updated version of the computer program that is intended to mimic his behaviour.

Despite these good intentions and careful preparations, sometimes everything goes off on the wrong track -- the expert chooses an inappropriate problem, or the knowledge engineer chooses the wrong tools with which to express the process. Nii has written, "One of the difficulties of writing knowledge-based programs is that at least two parties are constantly shifting their points of view: the domain expert and the knowledge engineer. As the knowledge in the program accumulates and the problem becomes clearer, the knowledge engineer may find better ways to represent and process the knowledge. The resulting behaviour of the program may inspire the expert to shift his view of the problem, creating for the knowledge engineer further problems to be solved. Development of expert programs involves a process of finding a workable relationship between experts and programmers and slowly evolving a program structure that will work." It's an elaborate and tricky pas de deux.

CHAPTER SEVEN

AUDITOR-AUDITEE RELATIONS

INTRODUCTION

The internal auditor's role is complicated considerably by environmental, behavioural influences. Familiarity with these influences can help the auditor to prepare appropriately to carry out audit assignments in a way that will enhance the potential for successful results.

In this chapter an attempt will be made to sensitize the auditor to the existence and implications of the various behavioural effects for the audit function, and to what actions the auditor might take to deal with them while maintaining audit effectiveness.

Behavioural influences, referred to in this chapter as auditor-auditee relations, have several generic aspects and some that are process-specific. Accordingly, the discussion to follow is presented in four sections: two generic ones on role-related and organization-related influences (Sections One and Two); an audit process-related section (Section Three); and lastly, the implications of non-audit activities (Section Four).

Although the chapter is generally entitled "Auditor-Auditee Relations", in the detailed discussions a distinction is made between the direct auditee and the ultimate client. This distinction is dealt with specifically in a subsequent section but is recognized throughout.

The auditee's perception of the auditor has to be faced squarely at the outset. Given that the behavioural implications of the audit role are recognized by the auditor, much of the potential reaction (specifically negative reaction) of the auditee to the auditor can be neutralized or compensated for. Most of the relevant issues are raised; however, those that are covered in the literature are not dealt with exhaustively.

A Bibliography is provided for those who wish to delve further into this important aspect of auditing. A caveat regarding relevant literature is in order. Although relevant literature is quite extensive on some of the topics raised in this chapter, it is usually not presented in the audit context. Therefore considerable scope remains for auditors who wish to add to the audit body of knowledge in this area.

SECTION ONE: ROLE-RELATED INFLUENCES

Relationship Between Staff and Line Roles

Internal Audit as a Staff Function

In ideal terms, the distinction between line and staff is very clear. Line managers make the decisions regarding production and delivery of the product or service of the organization under consideration, and staff managers advise the line officials/managers in making those decisions. As might be expected, the real world does not behave in so clear-cut a manner.

In practice, the distinction between line and staff is not one of "white" and "black", but rather one of "shades of grey". For example, is purchasing part of the production process? What about sales, marketing, research and development? Even those functions traditionally seen as staff functions (e.g. finance, personnel, EDP) have both line and staff roles; staff with respect to the managers served, and line with respect to their own function (responsibility centre).

The internal audit function is no exception in this respect. However, in terms of its role vis-à-vis the auditee, it resembles the role of a staff specialist rather than a function specialist such as the comptroller. Whereas the function specialist (e.g. the comptroller) has responsibility for, and is accountable for, financial systems that are used by line managers, as well as for provision of financial advice, the internal auditor provides advice only.

In any case, the key distinction is made on the basis of who makes the final decisions in the area under consideration. In the case of the auditor, it is the auditee who is expected to make the decision, regardless of who the auditee is (i.e. line or staff manager or, at the highest level, the client). The auditor is merely one of the information sources which impinges on the auditee manager's decision-making process.

There are three main messages to be received from the foregoing discussion:

- the role of the internal auditor is that of adviser; either the auditee manager or client makes the final decision as to disposition of findings and related recommendations, depending on the level of the finding;
- the auditor's normal output is one source of input to the auditee's decision-making process and, therefore, the auditor's activities and results should be attuned to the auditee's key decision areas if that role is to remain relevant; and
- audit heads or managers perform line-type activities with respect to audit operations.

Historical Role of Auditors

- The earliest application of an audit-like role was in conjunction with tax collection and consisted primarily of fraud or defalcation deterrence and detection. To some degree, this role is retained by modern auditors (whether external or internal), however, it is no longer the primary one. Nevertheless because of this historical association a residual image of the auditor as "police officer" persists in the mind of the auditee and public at large. This fact needs to be kept in mind in planning for and implementing audit activities.
- In the private sector, external auditing is focused on financial statements and underlying controls. Private sector internal auditing, although broader in context, is concerned primarily with financial and managerial accounting by virtue of the fact that private sector organizational goals revolve around some measure of return on investment, which is usually represented in financial or dollar terms.

The auditor's image of "police officer" is both archaic and current. Archaic in that the fraud-detection role is only a minor aspect of the modern internal auditor's role set. However, to the degree that the auditor continues to review, evaluate and comment on the auditee's performance (whether directly or indirectly), a surveillance connotation is unavoidable, even necessary (e.g. for deterrence purposes).

Given the unavoidable element of surveillance in the auditor's role, the only recourse left to the auditor is to recognize the implications for auditor-auditee relations and its impact on the efficiency and effectiveness of the audit function.

A police officer can establish a reputation for balance, fairness, humanity and competence, in which case a considerable measure of cooperation is likely (e.g. the British "Bobby"). On the other hand, given the public's natural mistrust of all authority, it is much easier for a police officer to be seen as an arbitrary, biased, "bully" who uses and enjoys the superior role that the law allows.

Similarly, the auditor can establish the reputation of an ally or at least of a neutral observer. However, the more likely image will be that of police officer, in the most negative sense. This image will have to be recognized and every effort made to replace it with one less hostile, if the auditor is to be effective.

To establish a strategy for neutralizing the typical negative image of the audit function, the elements of that negative image must be identified, along with their sources, and individually addressed. Some of these are enumerated below (see Mints¹):

| <u>Elements</u> | <u>Source</u> |
|-----------------|--|
| Fear | <ul style="list-style-type: none">- fear of the unknown (never faced an auditor before);- historic reputation of audit function;- auditee is aware of weaknesses that have not been made known to superiors and fears being found out;- fear of fraud or defalcation being detected; and- fear of disturbance of the status-quo. |

1 Mints, Frederic Ernest, The Effects of the Internal Auditors' Behavioral Patterns on His Relationships with Operating Personnel.

- | | | |
|------------------------|---|---|
| Suspicion/ Distrust | - | auditors motives unknown (first time auditee); and |
| | - | natural suspicion of any outsider. |
| Resentment | - | of any control role; |
| | - | of the interposition of a powerful third party into the normal supervisor- subordinate relationship; and |
| | - | of the auditor getting credit for identifying problems/ putting forward ideas already well known to the auditee, without giving due credit. |

Given the natural tendency of the auditee to harbour a negative image of the auditor, and considering the degree to which the efficiency and effectiveness of the audit process depend on good communications, there is obviously a need, on the part of the auditor, for a very proactive effort aimed at neutralizing that negative image. Otherwise, the auditor can expect considerable distortion and reticence in the communication process, with consequences for the audit process in terms of both efficiency and effectiveness. Efficiency suffers in that suspected reticence and distortion in communication requires auditors to do more verification while effectiveness has to do with the potential for misleading or missing information leading the auditor to erroneous conclusions.

The above list of elements, which contribute to the auditor's negative image, is stated from the auditee's point of view. There are a number of ways in which the auditor may contribute directly to this negative image by:

- exhibiting a superior, arrogant, discourteous or condescending attitude;
- being ruthless and inflexible;
- being manipulative;
- being biased/unfair;
- being inadequately prepared (i.e. demonstrating incompetence);

- not distinguishing between significant and petty findings;
- presenting results in a negative, blame-oriented manner; and
- not giving credit where credit is due and not explaining mitigating circumstances.

Once the factors leading to a less-than-flattering image of the auditor are enumerated and digested, appropriate action can be initiated to counteract them. As may be seen by the very nature of the factors involved, the task is an unceasing one.

Some of the results of a research study (Doctoral dissertation), carried out by Frederic Ernest Mints², should be helpful in determining where efforts to improve the auditor's image should be placed. For example, it was found that reactions to the auditor depend on the level and attitude of the superior. The higher the level, the less negative the image (possibly because the higher-level manager does not feel directly under attack and, so, less threatened). Also, it was found that if the superior had a positive reaction to the auditor, the subordinates were also more positive. However, subordinates involved in technical activities tended to be more antagonistic than regular line employees, probably because it is more likely that their ideas are being attacked in audit findings.

As to the second issue, that of private versus public sector auditing, the following factors need to be considered. Public sector audit has recently had its scope of activities broadened to include some version of comprehensive or broad-scope auditing (in the federal government: the OAG in 1977 and Internal Audit in 1982). This extends the auditor's interest to assessment of economy, efficiency and effectiveness of all operations, at least in terms of the controls associated with these types of performance requirements.

2 Ibid, pp. 33-37.

Broad-scope notwithstanding, the auditee population and the public in general, still see the auditor as essentially financially oriented and preoccupied with dollars and compliance. In this context compliance tends to be construed as rules or means, as opposed to results or ends centred.

This image persists, in some cases, with good reason. Many audit groups, although nominally auditing according to broader mandates, are populated with former financial auditors whose expertise is in the financial area of their host organization. Furthermore, even when auditing in non-financial areas, there is a tendency to concentrate on financial aspects of the operations under audit.

The financial/compliance image can be mitigated with a combination of initiatives. The first initiative is communication, which serves to sensitize managers to the true nature, extent and thrust of modern internal auditing, and to elicit their concerns and support. The second is the demonstration before, during and after an audit assignment, of an attitude of empathy and constructiveness and an aura of knowledge, competence and objectivity. Finally, the results produced must bear out the constructive attitude and quality of output promised.

In summary, internal auditors must be conscious of the inherent negative image that they suffer due to the historical role of auditors and, therefore, be constantly working to mitigate it.

Independence and Objectivity

Independence and objectivity are dealt with extensively, and relatively consistently, in the audit literature, and it is not the intention to repeat that content here. However, there are some aspects of the subject(s) which bear clarification and elaboration. For example, the concepts of independence and objectivity are dealt with as if they were interchangeable. Also, the two concepts are typically dealt with as if they had intrinsic value which is independent of the auditor's role. This is, of course, true for some, but not all, of the factors involved, as will be demonstrated in the following discussion.

In dealing with the concepts of independence and objectivity, or for that matter all the concepts in this chapter, it is important to bear in mind the ultimate purpose of an audit activity. As displayed in Figure 1, the effectiveness of internal audit activity is ultimately determined by the degree of performance improvement in the auditee's area of responsibility which may be attributed to audit activity.

The degree of performance improvement that is attributable to audit activity is, of course, difficult to determine since auditee performance is dependent upon a number of variables, only one of which is internal audit. Furthermore, internal audit may not be the most influential one. Nevertheless, the perspective that this approach gives to the auditor is important; i.e. the ultimate purpose of audit activity is not superb reports but improved auditee performance. However, the importance of the report's quality should not be underestimated as a motivator.

To achieve improved performance, the auditee must be motivated to appropriate action. This will only happen if the auditee's attention, and subsequent acceptance, is obtained. Attention is obtained by provision of information which is relevant, while acceptance depends on its credibility. Finally, credibility is affected by a number of environmental and individual (audit group, auditor) factors which affect the existence and appearance of independence and objectivity of auditors (see Table 1).

In the discussion of independence and objectivity it is important to recognize the precedence relationship between them. The goal is objectivity (in fact and in appearance). Once this is clear, it is easier to think in terms of the actions one must take to achieve that desired end.

Table 1 enumerates a number of the key factors affecting the auditor's independence or objectivity. It is divided into three major lists to focus attention on both their relationships and their differences in terms of the decisions and actions the auditor might take to enhance the credibility of the audit group and its products.

FACTORS AFFECTING AUDITOR'S CREDIBILITY
(and ultimate effectiveness)

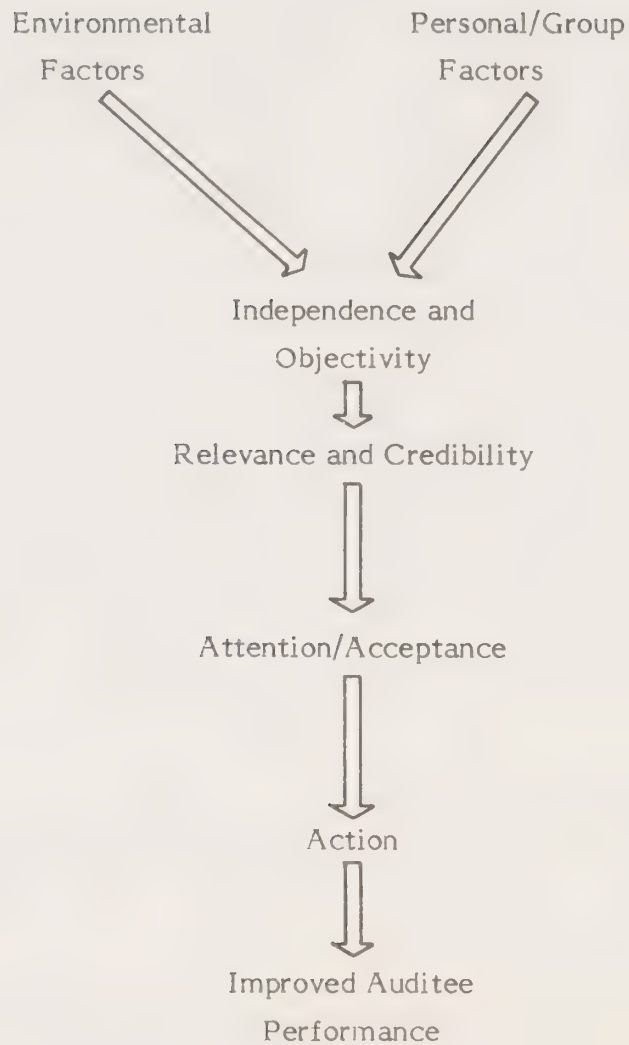


Figure 1

Table 1

Factors Influencing Independence and Objectivity

ENVIRONMENTAL FACTORS

Policy/Standards
(central agency)

Audit Mandate
(departmental)

Reporting Relationship
(organizational level)

Function Organization
(centralized/decentralized)

Audit Committee

Senior Management Support

Physical Location

Activities Assigned

Supervision

Reputation
(of profession/group)

INDIVIDUAL ATTRIBUTES

Background

Affiliation

Intellectual Independence

Personal Integrity

Education/Training

INDIVIDUAL ACTION

Conduct

Demonstrated
Balance/Fairness

Demonstrated
Competence

Personal Image

Personal Reputation

The environmental factors list consists of preconditions for independence, in fact and appearance. Since audit literature deals adequately with these factors, they will not be discussed here except to reiterate that they contribute to, but do not guarantee, objectivity. Conversely, if one or more of those preconditions is not met, it does not preclude objectivity in fact, although it makes being seen to be objective more difficult. All of these factors should be seriously considered in establishing an internal audit function if its effectiveness is to be maximized.

The second list, that of individual attributes, has implications primarily for internal audit human resource management. To the degree that individual attributes are a product of genetic and early environmental history, the only tangible, relevant action affected is recruitment. Although the required attributes are often difficult to detect through interviews and written tests, they should get due consideration. References and examples of past output are particularly relevant. Of course, the portion of the background that is the product of education and experience is subject to influence by judicious training and/or assignment initiatives. To the degree that competence, or the appearance thereof, is a contributor to objectivity, these initiatives could be beneficial. In any case, they would certainly contribute to improved relevance.

Affiliation has two aspects. The first, that of personal philosophy, school of thought, etc., is not subject to much influence, in the short term, and may be difficult to detect during recruitment. The second, that of professional, social or other affiliation, is more amenable to influence and should be considered by both auditor and audit manager for its potential impact on objectivity.

The final list, individual action, is ultimately the most important since it reflects the factors with the greatest influence on objectivity in a specific instance (e.g. audit assignment). Auditors, being on "foreign territory" for the majority of their activities, must be particularly careful of their conduct. This includes attitudes displayed (e.g. arrogance, condescension, insensitivity), independence of thought and opinion, social relationship (e.g. favouratism, fraternization), and rigour (e.g. substantiation, thoroughness, logic).

Finally objectivity must be demonstrated in the auditor's equivalent of the "bottom line", the report (whether oral or written). This consists of two factors, content and presentation with obvious implication for the required skill set.

Throughout all these considerations the adage about good reputations being difficult to build but easy to tear down is particularly relevant for auditors or, for that matter, to any person or group that depends on persuasion for effectiveness.

The Auditor as Catalyst

All the role-related concerns discussed thus far have implications for the auditor's role as catalyst. Since the auditor does not make the change decision, it is the auditor's influence role that predominates. Influence is, of course, highly dependent on context, credibility and communication ability.

There are, however, other factors to be considered. If, as advocated in the previous sub-section, the auditor's effectiveness depends on implemented changes to the auditee's processes which result in improved performance, then being a successful catalyst depends heavily on timing as well as content and persuasiveness.

Timing, in this context, has its own set of implications. It depends on such factors as the organization's current conventional wisdoms, coalitions, opinion leaders, competing initiatives, capability to implement, capability to absorb, and compatibility with thrusts and goals. Many of these factors are self-evident, once explicitly identified, but often neglected by auditors in the development and presentation of their results.

There are three related aspects to take into account in ensuring that these factors get due attention. One is awareness of the factors, the second is willingness to take them into account and the third is capability to deal with them. Awareness is dealt with through appropriate training, methodology and supervision of the auditor. Willingness depends on incentive, and capability on training, experience and natural ability.

The key to the issue is willingness. This is primarily an attitudinal problem. There are many auditors who feel that their job is done when they have identified weaknesses and written a report based on those findings. Implementation, not being their responsibility, is given little consideration. This is perhaps a carry-over from the external audit "attest" orientation. Whatever its source, it is a sterile/unproductive approach which promises little for the auditee besides criticism. What is more likely to impress the auditee is potential for marked improvement of material consequence in the performance of his/her operations.

In summary, the auditor must go beyond sterile reporting of facts, no matter how relevant and material. Findings and associated recommendations must demonstrate the consideration of appropriateness, given the current conditions in the auditee environment; i.e. how likely is the recommendation to be implemented?

Auditing versus Investigating

The roles of auditor and investigator have many similarities, but also some important differences. The similarities and differences can be characterized in two general classes. Those having to do with results expected and those which concern process.

Normal internal audits do not generally result in legal proceedings, and instances where special audits are initiated due to suspected fraud are even less frequent. However, since the possibility does exist, an awareness of the implications of audit evidence becoming the subject of legal proceedings is desirable.

Although the results of an audit may be such that legal proceedings can ensue directly from them, the more likely situation will require that further evidence, appropriate for use in a court of law, be gathered. This implies two points of difference, both having to do with the difference between audit and legal evidence. The evidence gathered depends on two factors which represent the two points of difference. One is mandate and associated powers (legitimacy), the other is process.

The auditor typically does not have a mandate to search personal effects, to talk to outside parties about activities of auditee personnel, take sworn statements, etc., nor is an auditor necessarily skilled in these areas. If the auditor were to engage in such activities, some difficulty could be expected in defending them in a court of law under cross-examination; for example, in a defamation of character suit. Also, an auditor does not usually have any legal or forensic training.

There are cases where the two roles, that of audit and investigation, are combined into one composite group. For example the U.S. federal government has inspectors general who have such dual mandates. However, even in these cases a distinction is made between these two activities in terms of mandate, skills required and results expected. In these cases audit evidence may trigger investigative activity but investigation is treated as a separate process resulting in separate reports.

Where the incidence of fraud, abuse and related activities is high, there may be advantages to having these two groups working closely. The main disadvantage would be that any tendency on the part of the auditee to view the audit function as a police role would be strengthened. This in turn would tend to detract from the constructive, collegial approach that modern internal auditors try to foster.

In conclusion, although the two roles of auditor and investigator are similar, and in fact may share data, they are not identical. They typically differ in mandate and in process and require different skills. Also, combining the two roles would tend to reinforce the police image of auditing.

The Impact of Other Audit and Quasi-Audit Groups on the Internal Audit Role

Second to managerial monitoring, internal audit should be the main control oriented activity in a department or agency. This has implications for internal audit's role vis-à-vis other audit and quasi-audit activities, particularly those initiated by external agencies (e.g. OAG, central agencies). Also, the way in which non-internal audit groups carry out their role will inevitably affect internal audit itself, since auditees very often do not discriminate between internal auditors, external auditors and quasi-auditors.

There are then, three related factors to consider. The first is the co-ordination of activities such that a minimum of duplication of effort occurs. The second is internal audit's role of buffer for the host department and adviser to management regarding these other audit roles, activities and outputs, and third is that of differentiation of internal audit's role so that any negative experience on the part of the auditee is mitigated.

In sum, internal audit has the responsibility to the limit of its mandate to minimize the disruptive effect that other audit and quasi-audit activities may have on departmental management.

SECTION TWO: ORGANIZATION-RELATED INFLUENCES

Stability of the Auditee's Organization

In any control activity, audit included, there is a presumption that the auditee's goals, processes and environmental conditions are stable; that is, they are either static or changing in a predictable way. In the latter case the predicted changes should be reflected in plans, processes and associated control objectives. If the processes are not stable (i.e. are in a state of unpredictable flux) then one cannot expect predicted performance criteria.

From the point of view of auditor-auditee relations, it must be remembered that an unstable situation usually means that the whole auditee area is under considerable stress. The auditor, therefore, must first recognize this situation and proceed in a way that will not aggravate it.

Although the foregoing assertions are self-evident, once stated, they are all too often ignored or given little weight in audit assignment plans and activities. To act upon these assertions requires a more detailed understanding of the auditee environment; however, indications of such an understanding in the way in which the auditor plans, identifies weaknesses and makes recommendations is, typically, not evident. The predetermined control model should reflect any tendency to instability or variability in the auditee processes, but seldom does.

In the case of instability, the concept of a predetermined control³ model is essentially irrelevant for these portions of the auditees process that are in a state of flux. If the system (process) or sub-system being controlled is behaving in an unpredictable way, it is unlikely that reliable control objectives can be established for the relevant controls. The best that an auditor could expect under the

3 See Volume II, Part 2, Chapter 2, "Control: Concepts and Applications for Internal Auditors".

circumstances is some evidence that the auditee recognizes the existence of the instability and has, or is making, plans for bringing it under control. Given that stability can be predicted for some future date, the auditor would then arrange to reschedule the audit accordingly.

Where the auditee process is stable but varying in some predictable way, the auditor would expect to find corresponding variations in control objectives for each relevant control such that control objectives parallel the state of the process being controlled. This is a rather sophisticated strategy, requiring equally sophisticated control and audit methods.

The situation where its process is stable but varying in some predictable way can occur for two reasons. One is where the program or project being undertaken is such that the outcome is not known with certainty; i.e. a living experiment. This is not as uncommon as it sounds. Many socio-economic policies/strategies are not testable/verifiable in a controlled-experiment environment, in which case the only recourse is a live experiment. In this case both the result and the delivery process will be subject to controlled variability (i.e. variation by design), and the control framework would be expected to vary accordingly, in both form and substance (goals). Also, since the delivery process has not stabilized (is expected to vary), both it and its corresponding controls may be expected to be more flexible, less permanent and often more costly.

The second possibility is where the expected result is reasonably well defined but the most effective method of delivery is uncertain. Here, as in the above case, the auditor would expect to find a more variable control framework.

Generally, unless the assignment plan and the predetermined control model, along with its associated audit program, reflect instabilities in the auditee processes and/or environment, the audit process and results are unlikely to take account of them and are therefore very prone to be judged insensitive, if not irrelevant.

Management Style

There are many aspects of management style that could be discussed from the point of view of management theory, however, for audit purposes, only those aspects most relevant will be discussed here, namely those having to do with management control.

In most large organizations stability is central in the consideration of what effect management style has on an organization, as it is formality of process that is usually the key variable affected by variations in management style.

In a small organization, where contact between decision maker and decision implementer is frequent, and relatively direct, a considerable amount of variation in formality is evident and may be tolerated; subject to tests for goal achievement. In large organizations, the auditor would be well advised to be skeptical of informal processes because of the inherent limitations of word-of-mouth communication. Given that sensitivity to this issue exists, tests for this potential weakness can be readily planned and implemented.

It is also intuitively evident that an organization that is operated in an autocratic and/or centralized manner will be much more dependent on effective formal controls than those run on a democratic/decentralized model. This distinction should be reflected in audit assignment plans and programs as well.

In conclusion, management style has an effect on an auditee organization's control framework which should be probed for, recognized and reflected in audit assignment plans and programs, if the efficiency and effectiveness of the audit process is to be optimized.

Complexity of Process and Product/Service

To those auditors well practiced in organization/process modelling the assertion that the control structure is directly proportional to the complexity of the system being modelled is self-evident. This assertion stems from the findings of sociological/psychological research that all humans demonstrate a deterioration in their ability

to make optimum decisions as the decision increases in complexity. This topic is dealt with in detail in other chapters of the Handbook (e.g. Part 2, Chapter 5, "Audit Evidence", and Part 2, Chapter 6, "Auditor Judgment") and, therefore, will not be elaborated here except for the issue of optimality.

Much of management literature reflects preoccupation with management decision-making, and, in particular, with the issue of maximization/optimization. Management science literature, typically, describes the objective of management science techniques as profit, maximization or results optimization.

Ideally, the goal of maximum return or optimum result is difficult to object to; however, in pragmatic terms it is somewhat impractical. In the case of complex decisions, it is difficult, if not impossible, to enumerate all possible, relevant alternatives; and even if it were, it would probably take too long. This is due both to inherent and human limitations on the part of the decision-maker. This situation naturally leads to a search for less idealistic alternatives which, although not abandoning the ideas of maximization/optimization where practical, recognize less demanding, but more viable, approaches (e.g. "Bounded rationality", March and Simon⁴; and, "muddling through", Lindblom⁵).

The auditor needs to recognize those limitations in assessing control weaknesses in order to ensure that results reflect realistic expectations.

In carrying out assessments of auditee operations, auditors should expect more complex processes/products to be backed by more elaborate decision-support systems and corresponding controls. By analogy, it should not be surprising to the auditor if simple environments have little documentation, or none at all.

4 March, J.G. and Simon, H.A., Organizations.

5 Lindblom, C.E., The Science of Muddling Through.

The Presence of Informal Coalitions

It is well known that all organizations possess informal links and power structures which do not necessarily conform to the formal organization structure. This has already been alluded to in a subsequent sub-section dealing with the auditor's role as catalyst. The implications of this, of course, go well beyond the change-agent role.

The effectiveness of the audit role depends heavily on its ability to influence the decision-making process of the auditee. This presumes knowledge of the key players in that process (both direct and indirect - e.g. influencers/opinion leaders).

Actually, knowledge of the power base in the auditee/host organization is important to all aspects of the audit process: in planning, when deciding on key audit target areas; in the audit process, when accumulating audit evidence; at the reporting stage, when deciding on materiality of findings and the form of related recommendations; and finally during the follow-up stage, when deciding who is most likely to be instrumental in a recommendation being implemented.

In sum, an effective internal audit group is well advised to identify and take due account of the host organization's "movers and shakers".

Deputy Head/Superior, Audit Committee and Management Committee Relationships

Deputy Head/Superior-Auditor Relationship

As advocated in the Standards, (see Institute of Internal Auditors in Bibliography) it is preferred practice to have the head of internal audit report to the deputy head of the host organization. However, the relationship must go beyond simple organization chart formalities.

The relationship must be "real". That is, the head of internal audit must have meaningful, on-going contact which is visible to the rest of the organization. Crucial points of contact are: during strategic and long-term planning to identify thrusts, concerns and priorities; prior to each major audit to identify specific

concerns; during the audit for urgent feedback; after the audit for debriefing of selected results (directly and/or through the audit committee); and ad-hoc for advice (e.g. regarding external audits or central agency reviews, special audit requirements) and administration.

Where the deputy head is not the auditor's immediate superior, the potential for disruption of the preferred communication pattern, as described above, is increased. Where the deputy head is not the immediate superior, the preferred relationship is one in which the head of internal audit reports administratively to the superior (direct reporting relationship) and functionally to the deputy head (dotted-line relationship). If this situation prevails, then all relationships described above may be retained except for the administrative one. Unfortunately, this is unlikely. Where preferred reporting relationships are not implemented it is usually due to a large span-of-control or other factors which usurp the deputy head's time, making her/him unavailable to the head of internal audit as often as would be desired.

In the case where contact with the deputy head is restricted, alternative organizational arrangements and channels of communication need to be established such that the independence, support and contact regarding organizational strategies, thrusts, concerns and priorities are preserved.

Audit Committee and Management Committee Relations

This subject is covered extensively in Chapter 2, Volume I of the Internal Audit Handbook, however, some elaboration will be provided here regarding the associated management committee activities. Associated activities, in this case, include discussing organizational and program strategies, thrusts and concerns, monitoring the organization's state and building organizational rapport.

Where the audit committee activity is simply a unique time, or a section, in the agenda set aside by management committee for audit matters, the audit head can be given a standing invitation to remain as observer for the rest of the meeting in order to carry out the associated activities just discussed. However, where a distinct audit committee exists, then other methods may be employed to achieve the same ends, including an invitation to attend individual management meetings.

This may be accomplished by visits with individual managers (necessary, to some degree, in any case) and attendance at management committee meetings, at least as an observer.

The advantages to being an invitee to management committee meetings, particularly those of senior management are: it provides an opportunity for the auditor to sample managerial climate, preoccupations, concerns, coalitions, etc., first hand; and it provides management an opportunity to get informal audit feedback and to take advantage of the auditor's special skills.

To summarize, the role of internal audit relies heavily on an intimate understanding of the host organization and its components. Therefore, effective reporting relationships and committee participation are indispensable to an effective internal audit function.

The Client versus Auditee Issue

In the foregoing the term "auditee" has been used indiscriminately to represent both client and auditee. The distinction is between the deputy head - the client, and the manager whose operations are actually subject to audit - the auditee.

The distinction is useful from various points of view as far as relationships are concerned. Although audits are performed for the benefit of both client and auditee, it is important to remember which is prime and what differences in product that implies.

The client is generally several organization levels removed from the operations. This makes judgment of true performance more difficult. This is partly due to the normal filtering and consolidation that goes on in hierarchical communications (formal and informal) and partly due to the human tendency to skew upward feedback in favour of good news.

The client, therefore, wants an independent confirmation that the auditee's area is performing as intended. To a large degree this translates into concerns that the Management Information System (MIS), whether formal or informal, indicates; i.e.

that the MIS is reliable and, except where executive level policy decisions are required, that action to correct deficiencies is being taken. On the other hand the auditee, being much closer to operations, has a better knowledge of the state of those operations. Therefore the auditee is relatively less interested in an independent confirmation of the state of operations and more interested in new insights as to the implications of the state of affairs, as reported, and identification and elaboration of opportunities for improvement -- a somewhat different emphasis.

This is not to say that the client is not interested in new insights and opportunities for improvement. However, it must be remembered that most findings and recommendations will be acted upon by the auditees on their own, and only in the case of department-wide (highest level) issues will the client need to participate personally in the decision on action to be taken and its subsequent implementation. Both points of view must be understood and observed in dealings with the respective respondents.

In planning for audits, although the auditee views and concerns need to be considered, it is the client who should have the final word - for two reasons: because of greater priority and because of the greater independence and, therefore, objectivity of the concerns expressed.

In sum, the primary and secondary relationship of auditor to client and auditee respectively needs to be recognized throughout the audit process.

The Use of Audit Agents

The use of audit agents introduces an important added variable into an already complex environment. However, it should be pointed out that this added variable could have positive or negative effects, depending on how it is implemented.

The positive aspect could stem from the fact that, in recognition of a complex or highly specialized auditee environment, the audit head contracts for highly respected audit agents with expertise in appropriate areas. The degree to which this turns out to be a positive experience will depend on the degree of prior respect, the behaviour of the audit agent during the engagement and the quality and delivery of the result.

This situation could just as easily turn out negatively if the conditions stated are not met; i.e. the audit agent is not highly reputed (as far as the auditee is concerned), mutual respect is not established, the agent does not demonstrate competence/objectivity/empathy or the result is of low quality.

An important concern to the head of audit is that the reputation of the departmental/agency audit function rises or falls with that of the audit agent. As far as the auditee is concerned the audit agent represents the audit head. Since the head of audit will typically not be in a position to manage the audit agent team on a daily basis (normally both professional standards and government contracting policies require an arms-length relationship), it is doubly important to choose wisely in the first place and to start with a very carefully worded contract/mandate. Of course, a contract can be terminated during an audit, for cause, however this is seldom feasible and, in any case, by that time the damage is usually done.

There is also the problem of relative familiarity with the auditee's operations. The audit agent cannot be as familiar with the auditee's activities as an in-house auditor, although repeated contracting with the same agent mitigates this problem somewhat. Given that relative unfamiliarity with the auditee's/client's organization and activities is inherent in the agent mode of audit, it is important that the audit head take all possible actions to minimize the possible negative effects of this. Possible actions include:

- provision of extensive advanced briefing and documentation to the agent;
- conditioning the auditee's expectations by describing what to expect;
- undertaking frequent debriefings with both agent and auditee;
- judicious follow-up; and
- decisive action if things go sour.

SECTION THREE: AUDIT PROCESS-RELATED RELATIONSHIPS

Overview

The two previous sections dealt with auditor-auditee/client relationships in general terms. When any of that material impinges on the discussion to follow it will not be repeated; however, its relevance is displayed in Table 2 for reference purposes.

In what follows, those auditor-auditee/client relationships that are peculiar to various phases of the audit process will be discussed under six headings (Internal Audit Planning, The Audit Assignment Process, Audit Assignment and Periodic Reporting, The Audit Follow-up Process, Special Audits, and Liaison Activities).

Internal Audit Planning

Identifying Management Concerns, Assigning Risk Potential and Developing Audit Strategic/Long-term Plans/Annual Schedule

As indicated in Chapter 3, Volume I of this Handbook and in a subsequent sub-section of Part 1, both auditee and client need to be consulted prior to, and during, the planning process in order to determine the nature and degree of their respective concerns.

Consultation with client and auditee should result in a reporting strategy, in the form of reporting requirements, which in turn will influence the whole audit process, as far as order, frequency, timing, type and scope of audits are concerned. Although the auditees are consulted, the client has the final word, particularly on strategic and long-term planning issues. This provision becomes more important where differences of opinion arise with the auditee; for example, as to scope or timing of an audit in the auditee's area.

Table 2

Relevance of Auditor-auditee Relationships
to the Audit Process

| Auditor-auditee Relationships | Audit Process Phases | | | | | |
|----------------------------------|----------------------|---------------------|-----------------------|---------------|-------------------|---------|
| | Audit Planning | Audit Assignment | Periodic Reporting | Follow- up | Special Audits | Liaison |
| <u>Role-related</u> | | | | | | |
| Staff/Line | | X | | X | X | X |
| Historic | X | X | | X | | X |
| Independence/ Objectivity | | X | X | | X | |
| Audit vs. Investigation | X | X | | | X | |
| Other Audit Groups | | X | | | | X |
| <u>Organization-related</u> | | | | | | |
| Stability | X | X | | | | |
| Management Style | X | X | | X | | X |
| Complexity | X | X | X | | | X |
| Formal/Informal Reporting | | X | | X | | X |
| Relationship | X | X | X | X | X | X |
| Audit/Mgt. Committee | X | X | X | X | X | X |
| Client vs. Auditee | X | X | X | X | X | X |

Negotiating the Annual Schedule and Audit Assignment Plans

As described earlier, both client and auditee are expected to be consulted in the preparation of strategic and long-term plans, with the client's views predominating. In the case of the annual schedules and assignment plans, negotiations would be expected to take place directly between the auditor and auditee, subject to constraints placed by the client, senior management and audit mandate/independence prerequisites. This means that negotiation is expected; however, its scope and range are limited to facilitating execution of audits without unduly disrupting the auditee environment, although raising of new concerns is not precluded.

The Audit Assignment Process

Audit Assignment Planning

Although mentioned briefly in the preceeding discussion, assignment planning needs further discussion in the context of the audit assignment sub-process, as it sets the stage for the auditor's prime activity and largely determines its success or failure.

It is at this stage in the audit assignment that the auditor either establishes rapport with, and support from the auditee, or is doomed to adversarial relations. Actions which can contribute to good rapport include:

- reflecting auditee's concerns in the scope of the audit in readily discernable form;
- establishing early contact with auditee to negotiate for: a convenient start date, convenient fieldwork periods (for multi-location audits), advance information, facilities for the auditors, help in assembling data for testing and offering briefings on the up-coming audit activities to management and staff;
- following through with briefings and any other promises made;
- being courteous and helpful but maintaining a professional attitude (i.e. avoid arbitrary, autocratic, abrasive behaviour);

- arranging meetings/visits well ahead of the event;
- not abusing privileges (e.g. use of facilities like copiers, word processing, EDP facilities);
- not going on "fishing expeditions" or personal vendettas; and last but not least,
- showing genuine interest in providing meaningful and substantial advice to the auditee, along with judicious feedback to the client.

Review of Operational and Managerial Controls

Although the ultimate objective is to provide an opinion on the state of management controls, it is inevitable that the auditor review the underlying operational controls as well. In the same way that the external auditor reviews financial controls, in order to determine the degree of reliance that may be placed on the data provided in the financial statements and consequently to determine the amount of testing required, the internal auditor reviews operational controls to determine the reliance that may be placed on management information provided in the Management Information System and on the continuity of operational processes. This provides the rationale to both auditor and auditee in those cases where auditors spend substantial amounts of time with operations staff.

What is less obvious is the rationale for spending considerable amounts of time with staff officers. There are several reasons for this, some more evident than others. The staff officer is frequently in a float position, readily convertible to in-line administrative and/or production roles in the short term. In addition, staff officers often take on some portion of their manager's role, although this is not recommended practice.

This latter practice needs special attention since this type of situation makes it difficult for subordinates to determine exactly who is giving the direction (i.e. how seriously to take the officer's advice-cum-directive). This situation gets particularly disturbing when such action is taken on the officer's own initiative, as a self-

aggrandizement move, rather than on the request of the manager. In either case the auditor should be looking for evidence that all subordinates are aware of any delegation of decision-making to staff officers along with the limits of such delegation.

Regardless of the latitude of the staff officer's activities, and their relative desirability, the existence of such an arrangement is of interest to the auditor, because the staff officer will likely be the best informed source on auditee operations/management, particularly with respect to unofficial/informal environmental conditions (e.g. coalitions, conventional wisdoms, local preoccupations and thrusts).

Another aspect of modern internal auditing is that in most of the operations under audit the predetermined control model will not reflect absolute standards. The implication for auditor-auditee relations is very immediate and crucial. It means that the determination of weaknesses in the control framework will be much more judgmental and that, except for extreme examples, findings and conclusions will depend heavily on joint auditor-auditee agreement rather than being unilaterally and independently determined by the auditor.

This puts a great premium on good rapport with auditees, at least key auditees, and on the technical and interpersonal skills, and negotiating ability of the auditor. Where good rapport is not established the likelihood of meaningful results, at least to the auditee, is doubtful. However, useful results for the client are not totally precluded. This depends on how formally the organization is managed. If documentation is sound and complete, much can be accomplished by document review and associated testing, regardless of the degree of cooperation obtained.

The worst case of poor rapport involves deliberate attempts to mislead or harass the auditor. Apparent good rapport, however, does not preclude disruptive tactics. Where they occur they will likely be more difficult to detect simply because the auditor will be less on guard. The most difficult aspect of rapport is deducing the auditee's attitude. The auditee usually is aware of the auditor's mandate and senior management support and therefore will not likely be openly hostile.

Generally, regardless of the auditee's initial attitude, the auditor should encourage openness. Often a negative attitude can be due to a simple misunderstanding of the auditor's role, mandate and methods. Open discussion can bring this out and provide the opportunity to clear the air early in the process.

A factor, which is pervasive in organizations is the "hidden agenda". This factor can be positive or negative in the context of an audit assignment process. For example, the auditee may try to push an idea which has been turned down by superiors or to further a personal end in an organizational power struggle. If a good idea is involved, such influence could be beneficial; but a bad idea could result in ill-will; if a power struggle is involved, it could be destructive. In any case the auditor should be forearmed and wary of this situation; forearmed with solid knowledge of the auditee's environment (including proposals accepted/turned down in recent months/years) and wary of uncharacteristic cooperation.

From the above it should be evident that there is a high reliance on the auditor's interpersonal skills, particularly interviewing, since much of the information/data needed to identify findings and form conclusions, or at least insights which lead to hard evidence, will be obtained from people. There is abundant literature on this subject; therefore, only a brief summary will be presented here, oriented to the internal audit process.

Because of the typical environment in which an auditor-auditee interview takes place (i.e. at worst hostile, at best neutral) it must be carefully prepared for and delicately executed. The potential image that the auditee might have of the auditor (see Section Two) needs to be kept in mind.

In preparing for the interview, background documentation should be well researched so that the auditor is well prepared and does not waste the auditee's time; proper channels should be followed in setting up the interview; the objectives of the interview should be clear and points to be raised well thought out; and the conditions of the appointment should be strictly adhered to (e.g. time of arrival, time period allotted).

The interview itself should be kept on a courteous, friendly but businesslike footing. Questioning should be clear, concise and firm but not antagonistic. Questions should be a judicious mix of closed and open ended types so as to provide adequate opportunity for full expression where the auditee so wishes. Unclear answers should be summarized to the auditee to test the auditor's understanding and to prompt clarification if required. Provision for possible follow-up interviews (either with auditee or subordinates) should be discussed at this point, if likely to be needed in order to condition the auditee's expectations. Finally, closing remarks should include appropriate appreciation for time taken and a sympathetic acknowledgment of any inconvenience caused. A number of other useful points are raised in a paper by Robert G. Parker, in a recent CA Magazine article⁶.

Audit Assignment and Periodic Reporting

Audit Assignment Reporting

In terms of auditor-auditee relations and, more importantly audit effectiveness, reporting is the most important of all the audit activities. The effectiveness of audit findings and associated recommendations has to be measured, ultimately, in terms of what improvement their implementation has made in the performance of the audited entity. This means that a lengthy sequence of events has to take place, some of which the auditor has little direct control over:

- perception,
- acceptance,
- intention,
- action initiation,
- implementation, and
- confirmation.

6 Parker, Robert G., Learning Interviewing Skills for Problem Solving.

Most auditors have little difficulty in getting the auditee's attention (i.e. getting auditees to perceive a situation) since findings are usually a reflection of auditee data. Getting their acceptance is considerably more difficult. However, part of the difficulty experienced by auditors in gaining acceptance of their results can be traced to the early stages of the process involving perception.

Perception of facts and opinions communicated by fellow human beings is generally interdependent with perception of the communicator (i.e. the perceived credibility of, and general receptiveness to the auditor in this case). The issues of rapport and credibility have been dealt with in prior sections of this chapter. A second important determinant of acceptance is the timing and context of the information being communicated. These issues have also been raised in a prior section (see Section Two) however some comment specific to the audit process is in order.

Auditors have a tendency to delay reporting of results until the formal "exit debriefing" stage in the process. This is understandable to a degree, as the professional auditor wants to be as sure as possible of the facts and ensuing analysis before exposure of results. However, this virtue has its drawbacks. Being hit by a finding, particularly a major and unforeseen one, without prior warning can have a very negative impact on acceptance. The finding may not be intuitively obvious, it may not fit in with conventional wisdom, it may threaten cherished beliefs/processes/coalitions/even jobs, in which case the more time that the auditee has had to recognize, weigh, discuss, digest and, hopefully internalize the data, the higher the probability of acceptance. Also, early disclosure facilitates auditor-auditee synergy, the beneficial effect of which should not be underestimated.

What this implies is that it is desirable to introduce findings, or potential findings, to the auditee as early as possible in the audit process. It does not mean exposing findings prematurely. It is not beneficial, for example, to stampede the auditee into premature and ill-considered concern or even corrective action. A balance will have to be struck between the benefits of earlier exposure (seeding and cultivation of a desirable idea) and the possible negative effects of premature disclosure.

Other factors impinging strongly on acceptance of audit findings and/or recommendations include the orientation of the findings and manner in which they are presented, the degree to which the auditee's ideas, actions and mitigating circumstances are given credit and the way in which they are presented.

Orientation of findings has to do with how constructive they are individually and how balanced in aggregate. "Manner" refers to the degree to which a cooperative process was established, the degree to which win-lose situations were avoided and the flexibility the auditor displayed in the wording and disposition of findings and associated recommendations. Although the auditor should not compromise on the facts underlying the finding, considerable latitude normally exists in how the finding is presented and who it is reported to. In the case of disposition at least five main possibilities exist, in ascending order of importance:

- Minor finding - orally debriefed to the immediate auditee and not reported formally ("freebee");
- Important finding - where the immediate auditee is fully capable of dealing with the finding at that level of decision-making; no implications for higher level policy; formally reported in main body of the report but not brought forward to the executive summary for senior management;
- Important finding - (as above) but with implications for other parts of the organization (e.g. functional groups admin./program); formally reported and distributed to implicated groups as well as to the auditee;
- Major finding - policy or other implications for higher level management; formally reported in main body of the audit report and brought forward in the executive summary or a special report; and
- Major finding of unusual urgency (e.g. fraud identified) - brought to the attention of appropriate levels of senior management immediately.

The auditee's intention and action initiation activities can, and should be influenced by thorough discussion of the rationale behind the recommendations, by insisting on an action plan and offering advice during its development and by follow-up activity. Follow-up activity is also the main vehicle through which implementation and confirmation are encouraged.

The auditor is expected to play an additional role during implementation, particularly in the case of major infrastructure (e.g. program delivery process, EDP system) development. This activity has been termed "pre-implementation audit" and is dealt with elsewhere in Volume II, not including auditor-auditee relations aspects.

From the point of view of auditor-auditee relations the potential for conflict-of-interest in carrying out this type of audit has to be recognized and preventive/protective action taken accordingly. Two key actions come to mind. The first is to avoid a decision-making role in the project team (i.e. adopt the usual auditor/adviser stance) and the second is to avoid the assignment of the same auditor to subsequent audits of the relevant auditee area for a period of time.

Periodic Reporting

Periodic reporting includes presentation of annual summary reports on audit accomplishments and of audit plans. This is dealt with adequately elsewhere in this Volume. However, what needs further discussion is periodic reporting which represents management concerns and audit findings that do not fit conveniently into audit assignment reports.

The need for these has been introduced and discussed in Volume I, Chapter Three Development of Internal Audit Plans. In terms of auditor-auditee relations this vehicle is an important step in demonstrating the audit function's relevance. The key is structuring the content, form and timing of audit results in a way which is recognized by the auditee as addressing concerns in his/her terms rather than force-fitting them into the traditional auditor's approach to reporting.

The Audit Follow-up Process

This subject is covered in other chapters in Volume II and in other sections of this chapter. Therefore there will be no extensive discussion of this activity here except to reiterate a few basic aspects of its impact on auditor-auditee relations.

In carrying out follow-up activity, three pertinent facts need to be kept in mind: the manager has prime responsibility for confirmation, in particular, and follow-up in general; the audit group cannot be expected to follow up on all audit findings, regardless of importance; and repeat audits may not be sufficiently frequent to provide meaningful confirmation.

Therefore, it is important to encourage the auditee to verify (confirm) that the change made in the auditee environment, as a result of an audit finding, has been designed, implemented, is being operated as intended, and that the intended results are being achieved.

Special Audits

Special audits, by their very nature, have the greatest potential for reinforcing the audit function's relevance and also the greatest potential for undermining its independence role and ultimately its effectiveness/existence.

It is of course, always difficult to say "no" to your superior's request for service without endangering your organizational affiliation.

For example, it is difficult to convince a pragmatic manager that the auditor, who has just spent several weeks of his/her own time plus a considerable amount of the auditee's time on familiarization, identification and development activities leading to a major audit finding, should not continue the process by implementing a solution. It is simply a case of the auditee capitalizing on an investment, not to mention the flattering argument that the auditor is the best equipped to do that.

Similarly, it is not difficult to see how a senior manager could come to the conclusion that the auditor is the best equipped to carry out an investigation of a suspected fraud or defalcation.

The problem is that there are many activities/projects that are similar enough to auditing to be mistaken for it. In these cases the auditor has the responsibility to advise the potential auditee-client of the implications of the auditor taking on the proposed task and, if possible of viable alternatives.

These examples are, of course, non-audit tasks and will be dealt with further in the next section. There are, however, many instances of legitimate special audits. These generally take the form of special-interest, non-standard audits whose scope, depth or other characteristics do not conform to one of the standard types of audit. Aside from the fact that they, by definition, are not of standard form and therefore require extra, sometimes more innovative effort, there is little about the special audit process that has implications for auditor-auditee relations beyond those already covered in previous sections.

Liaison Activities

To the degree that any contact with the auditee has a lasting impact on auditor-auditee relations all audit activities have liaison implications.

The purpose of raising liaison at this point is to sensitize the auditor to the need for on-going contact (i.e. throughout the audit process) for purposes of maintaining a residual knowledge of managerial climate and concerns and for cultivating a residual rapport.

Liaison activity can easily become very time consuming and, therefore, should not be overdone. However, a limited amount of such activity can pay dividends in facilitating relevant planning, less time-consuming audit assignment start-up and better auditor reception during audit activities.

SECTION FOUR: IMPLICATIONS OF NON-AUDIT ACTIVITIES

In discussing the involvement of auditors in non-audit activities a distinction needs to be made between non-audit activities that are detrimental to future audit activity and those that are neutral.

The dangers resulting from the former have already been dealt with in terms of potential impairment of the auditor's independence. The only danger in the latter is that it takes resources away from legitimate audit activity and therefore, may not be cost-effective. In the case of the former, not only should that use of audit resources be questioned but the impact on the future effectiveness of the audit function should be seriously reviewed as well. In either case, significant re-allocation of resources to non-audit activity should require the approval of the audit committee.

CONCLUSION

In the foregoing an attempt has been made to sensitize the auditor to the existence, and implications of various behavioural effects for the audit function, and to what actions the auditor might take to deal with them while maintaining audit effectiveness.

Two generic aspects of the function were considered. The first, role-related, dealt with those aspects that, when recognized could be dealt with by auditors through individual preparation or action. The second, organization-related, is infrastructure based and much of the action suggested, or implied, has to do with setting up appropriate structures or processes to start with or alternatively, recognizing the implications due to inherent organizational peculiarities and acting accordingly.

This was followed by a section on auditor-auditee relations which are peculiar to the various phases of the audit process. Here, an attempt was made to integrate the generic behavioural concerns with those arising from the nature and timing of the activities carried out. In particular, the implications for auditor-auditee relations, of activities carried out early in the process (e.g. planning) and for auditee behaviour in later stages (e.g. reporting) were highlighted.

Finally the potential effects of non-audit activities on auditee behaviour were briefly explored. The potential for loss of independence (and ultimately for impairment of audit efficiency and effectiveness) was dealt with at various points throughout this chapter while the issue of cost-effectiveness of resource utilization was raised in Section Four.

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CHAPTER EIGHT

COMMUNICATION CONCEPTS FOR INTERNAL AUDITORS

INTRODUCTION

Much has been written about technical competence for auditors, and the emphasis on audit training in government has been largely in that direction. Apart from technical skills, auditors must possess a variety of interpersonal skills to meet the demands of internal auditing successfully. Among the latter, communication counts high on the list of essential abilities for an auditor.

While communication plays an integral and vital role in the performance of most professions, the internal auditor must be an especially skilled communicator to do the job properly. Communication skills form the basis for auditor-auditee relations and are essential to reduce the negative image which so often accompanies the auditor. The auditor must know not only how to communicate verbally and emphatically, but must be able to recognize and handle the feelings and needs of the auditee.

There is ample literature on the subject of communication. This will not be repeated. This chapter attempts to condense many aspects of communication down to those which have most relevance to auditing. Some examples of communications requirements as applied to various steps in the audit process are given, but the chapter speaks more to those elements which are relevant to the auditor as a communicator.

SECTION ONE: COMMUNICATION CONCEPTS

There are more than 25 different conceptions of communication, more than 50 different descriptions of the human communication process and more than 15 different models.¹ But there are similar characteristics in all communication processes.

Theories of communication include mathematical, behavioural and transactional models which attempt to put forward different explanations of what constitutes communication. For the purposes of this chapter, it is only necessary to understand the basic communication process which underlies all theories.

Communication begins when a sender has a message to convey. This message is coded or conceptualized and transmitted verbally or non-verbally. It is decoded or interpreted by the receiver who then takes action based on the interpretation. The receiver provides feedback to the sender repeating the entire process. When one considers that this process occurs each time communication takes place, it is easy to visualize the host of expectations and perceptions which influence the way in which messages are sent and received.

Communication Skills and Auditing

Of all the interpersonal skills necessary to an internal auditor, the ability to communicate is probably the most essential. It is the common thread running through the entire audit process and affects its efficiency and effectiveness. The manner in which the auditor communicates with the auditee will have an impact on the image, professionalism, credibility and ultimate success of that auditor. Indeed communication skills are at the core of auditor-auditee relations.

1 Sereno, Kenneth, and David Mortensen, Foundations of Communications Theory, New York: Harper and Row Publishers, 1970.

Auditor-auditee relations produce endless possibilities for stress, anxiety and frustration. Well-developed communication skills can assist the auditor in overcoming or significantly reducing their effects or, preferably, preventing their occurrence in the first place. On a personal level, communication skills can lessen the stress of interpersonal relations.

To be an effective communicator the auditor must first know the purpose of the communication, whether it be simply to inform, to obtain information, to change ideas and opinions or to obtain agreement. When the purpose is clear, the auditor can proceed to plan an appropriate approach.

Second, the auditor must know the willingness and capacity of the auditee to understand and accept the message. The auditor must therefore be concerned with the auditee's professional background, experience, level of interest and perceptions and recognize that these factors will affect the manner in which the message is received. It is unrealistic to expect all audit situations to result in total acceptance of the message being sent by the auditor. However, communication can still be effective if there is enough acceptance to get desired results. There may also be situations when it is not possible to persuade an auditee, and in those cases, more gains may be made by settling for a fair hearing.

Third, the auditor must know the impact required to influence the auditee to action. Different words, methods and emphasis are required to convey positive, negative or neutral findings. The auditor must get and maintain auditee interest. The auditee must be analyzed to determine whether the auditor is dealing with hostility, sophistication or apathy in the audit situation. This analysis will allow the auditor to select the appropriate approach to urge the auditee to action.

Last, the auditor must be able to devise appropriate methods to deliver the desired message with the right impact in order to influence the receiver to act. In the case of providing information which is fact-based, a presentation approach would suffice. However, changing ideas and obtaining agreement involves a whole range of logical and psychological considerations for the auditor. Changing ideas means convincing the auditee of the logic of the auditor's contention and influencing the auditee's willingness to listen and accept ideas.

In the world of the internal auditor, certain dimensions of communication are more relevant than others. While it is recognized that many aspects of communication enter into the auditor-auditee relationship, three are considered to occupy most of the auditor's time and therefore offer the most challenge. These are:

- establishing rapport;
- eliciting information; and
- gaining agreement (acceptance of findings and recommendations).

It should be emphasized at this point that these three challenges are interrelated and on-going during the audit process and do not necessarily occur in any specific order. They are iterative in nature but are treated in the order presented for purposes of this chapter.

SECTION TWO: ESTABLISHING RAPPORT

Establishing rapport represents a critical aspect of auditing since auditee cooperation hinges on positive auditor-auditee relations. Apart from a tense environment, poor audit relations can affect the progress of an audit where auditor's suggestions are not accepted or where information is withheld by the auditee. Moreover, studies have shown that when cooperation is established between auditors and auditees, through a participative approach, the auditor's recommendations are more readily implemented.²

While an audit environment can be positive, auditors must be equipped to deal with a negative one. The realities of auditing all too often produce ambiguity, conflict and political aspects which auditors must face. Auditees may be defensive about having their work reviewed and being subjected to criticism, fearing change. Hostility may be encountered by the auditor and manifested in verbal and non-verbal behaviour, attempts to intimidate and, in the extreme, physical efforts to eject the auditor.

Auditors may find themselves being used to further the personal goals of the auditee and must resist the temptation to exhibit their resentment.

Establishing rapport in the face of such obstacles represents a real challenge to the auditor. Technical competence, while necessary, is not sufficient to win the respect and cooperation of the auditee. Interpersonal skills and an understanding of behavioural science and human relations are crucial counterparts in the rapport equation.

The notion of rapport implies a range of factors, which, when taken together, produce an atmosphere of cooperation, harmony and dialogue. Achieving rapport requires a combination of personal qualities, experience and training.

2 Harmeyer, James W., Golen, Steven P., Sumners, Glenn E., Conducting Internal Audit Interviews, May 1984, Institute of Internal Auditors Inc., p. 4.

Auditors must temper a professional demeanour with a friendly attitude, exhibit openness and adaptability but know when to draw the line; to quote Sonja Sinclair, be "cordial but not cosy".³ The auditor's style and approach will naturally be a factor in establishing rapport. Efforts must be made to avoid exhibiting either an authoritarian, arrogant attitude or a laissez-faire approach. Striking the proper balance can mean the difference in gaining the desired cooperation.

A key component of nurturing rapport is keeping the auditee fully informed at all points in the audit process. Openness about the audit approach and audit findings will lower auditee defenses and encourage healthy dialogue between auditee and auditor. If possible, it is advantageous for the auditor to initiate informal contact with the auditee prior to the audit. Dropping by to introduce oneself can serve to break the ice and facilitate the more formal communication which will follow.

The first formal point of contact with the auditee is normally during the assignment planning phase of the audit process. Both oral and written communication are used to inform the auditee of the scope, objectives and criteria as well as general audit strategy proposed. At regular intervals during the audit assignment, the auditors should inform the auditee of general findings to create an atmosphere of participation and to ensure there are no surprises for the auditee later when the audit findings are presented.

In this approach, the auditee is able to discuss concerns and voice disagreement and ensure that the auditee's viewpoint is considered. Making the auditee feel a part of the process is key to maintaining rapport.

There are some situations, however, when the auditor must accept the fact that auditee opposition will remain strong and other methods of influencing the auditee must be found.

3 Sinclair, Sonja, Cordial but not Cosy; A History of the Office of the Auditor General, Toronto: McClelland and Stewart, 1979.

Eliminating or Minimizing Opposition

Inherent in the concept of establishing rapport is the idea of eliminating or minimizing opposition. Indeed if the auditee is not won over in the initial stages of the audit process, the quality of the audit will certainly suffer.

Eliminating or minimizing opposition becomes necessary in trying to overcome hostility or change beliefs. Auditees exhibiting these feelings put up barriers to communication which can seriously impede progress. Recognizing these barriers is essential if the auditor hopes to deal effectively with the auditee.

Hostility can be aroused if auditees perceive interviews as threatening. Auditors must take care not to react in a defensive manner as this could compound communication problems. Self-control and objectivity should be displayed to neutralize the auditee's negative feelings.

The auditor will often find it necessary to change the auditee's opinions when the latter's tendency is to see either extreme of an issue to the exclusion of the middle ground.

In wrestling with such communication difficulties, the auditor should accept the fact that there will be audit situations where it will not be possible to change opposition.

There are certain techniques which are useful to the auditor in attempting to eliminate opposition.

- **Seek common ground** - The auditor should begin discussions with statements or assumptions with which the listener will agree. Later in the conversation, the auditor can move to the idea with which the auditee initially disagrees. Couching disagreement in the broader terms of agreement will serve to put disagreement in context and minimize the possibility of a negative tone.

- Cite case examples - The auditor can often persuade a hostile auditee by marshalling examples and illustrations to support audit contentions. By building a convincing case to support audit opinion, the auditee will more likely accept the conclusion.
- Use candour - This approach can often disarm the auditee since it encourages an open exchange of information and assists in dispelling the hidden agenda impression so frequently suspected by auditees. Candour may take many forms. It can be achieved by attempting to reach a compromise or a workable solution despite disagreement, providing the auditee is willing to listen. Or the auditor may simply state his/her views along with the reasons and appeal to the auditee to rethink opinions.⁴

⁴ Vardaman, George T., Effective Communication of Ideas, New York: Van Nostrand Reinhold Company, 1970.

SECTION THREE: ELICITING INFORMATION

Up until the analysis of facts and the writing of a report, internal auditors spend most of their time eliciting information. The most familiar audit technique used to elicit information is that of interviewing. Much has been written on this subject and this section will not attempt to summarize the literature. Rather the aim is to focus on interviewing as a specialized form of communication for auditors.

Successful communication during interviews depends on thorough preparation and an understanding of what auditees want and need and how they think. It requires training and effort. Auditors should be given the opportunity to develop and hone interpersonal skills through training in interviewing techniques. These human relations skills will determine the nature of auditor-auditee relations.

Audit Interviews

Audit interviews play a major role in the gathering of evidence and provide information to corroborate, explain or contradict information gathered through other sources. Sometimes interviewing is the only method of gathering evidence. Auditors must be especially skilled in interviewing techniques to ensure they are gathering the right evidence.

Proper preparation for an interview allows auditors to become familiar with all available information on the person to be interviewed and the topic to be discussed. Preparation enhances the communication process by allowing the auditor to talk in an informed manner and to recognize and later deal with discrepancies in information which may surface during the interview.

A second important preparatory step for interviews is the development of information needed by the auditor and the design of questions to elicit this information. The design of questions will determine, to a large degree, the nature of information which will be obtained. Questions should be short, clear and direct. "Yes" and "No" questions should be avoided. While open-ended questions may be valuable in that they encourage the auditee to elaborate, care must be taken so that auditees do not digress. If properly handled, an open-ended question can provide an

opportunity for the auditor to gain insight into significant factors impacting on the audit, such as the auditee's management style.

Conducting an interview involves much more than a knowledge of its protocol - it requires skill in the art of listening. The auditor should ensure that a proper introduction is made, outlining the purpose of the interview, the topics to be discussed, where they fit in the audit and how the results of the interview will be used. A good introduction can help put the auditee at ease and minimize defensiveness.

In the conduct of an interview, auditors must be cognizant of impediments to the communication process, be they verbal or non-verbal. Differences in perception, personality conflicts, poor organization of ideas, physical distractions, defensiveness and poor listening habits are a few barriers to communication.

The Importance of Listening

"Almost 50 per cent of our time involves listening."⁵ Auditors must therefore develop listening skills and be aware of factors which can interfere with listening.

Active listening involves paying attention, remaining objective and rational, understanding the point and ensuring information is captured. Active listening means focusing on what is being said, restating the auditee's basic points, requesting clarification when points are unclear and remaining objective and unemotional.

Note-taking is recommended to ensure that major points are not lost.

The risk of taking copious notes is that the auditor is likely to miss what is being said. On the other hand, depending on memory to write notes after the fact can cause distortion. Either extreme has disadvantages, and the auditor should also take cues from the auditee when deciding on a note-taking strategy.

5 Harmeyer, James W., Golen, Steven P., Sumners, Glenn E., Conducting Internal Audit Interviews, May 1984, Institute of Internal Auditors Inc., p. 10.

One method of dealing with this matter is to have two auditors present at each interview where feasible. The presence of two auditors will enhance the accuracy of the interview exchange by allowing one auditor to conduct the interview and the other to record notes.

The auditor must also be a critical listener and know what to look for and what to challenge. For example, a questioning style which asks for specifics rather than generalities from the auditee is likely to produce more pertinent information. An auditor must be able to identify illogical or faulty thinking often evidenced when conclusions are drawn from limited information, and to read between the lines when circumstances dictate.

Auditee feedback, particularly non-verbal messages, provides valuable clues to the auditee's attitude at any given time. In fact, most communication occurs non-verbally and it is therefore of utmost importance for the auditor to be sensitive to such cues. Body language such as looking at a watch, giving a puzzled expression or a blank stare should alert the auditor to the need to restate or clarify the question, and perhaps even adapt the interview approach.

The auditor should demonstrate sensitivity to the operating conditions of the auditee and know when to end an interview. If all questions have not been asked within the allotted time, the auditor should only continue if the auditee is willing and should otherwise schedule another meeting.

SECTION FOUR: GAINING AGREEMENT

Gaining agreement lies at the very heart of an internal auditor's success as a change agent. This section examines gaining agreement through both oral and written means. A discussion of techniques for gaining agreement as they apply to oral interaction is contained in the first part of the section, followed by a review of written reports which constitute such an important aspect of auditing.

Apathy and hostility are great barriers to communication in that they create either a complete lack of interest or auditee opposition. They may be the result of poor experience with a previous audit, the auditee's feeling of powerlessness or the perception of a threatening situation. Before a strategy to gain agreement is advanced, the auditor must analyze the auditee to ensure the use of appropriate techniques to overcome any negative feelings that exist.

The process of gaining agreement begins subtly by establishing rapport. The better the rapport, the higher the probability of gaining agreement. However, rapport may be excellent yet the auditee may express disagreement. There are two notable stages when gaining agreement becomes critical: at the front end - gaining acceptance of audit criteria, and at the exit interview - gaining acceptance of audit findings.

Gaining Acceptance of Audit Criteria

The ultimate success of the audit hinges on initial agreement to a management control model acceptable to both auditor and auditee. For many audit areas, criteria to judge the adequacy of controls have not been translated into generally accepted principles. This may become the crux of a problem in that the auditee may not accept the criteria as the basis of an assessment of operations. The auditor may encounter greater difficulty where the nature of the operation is oriented towards innovation and creativity; managers of such areas may be inclined to view their operations as unique and management control as a hindrance.

In a scenario where the auditor has developed appropriate audit criteria but the auditee is not in agreement, the auditor must be prepared to use both logical and psychological arguments to convince or "sell" the auditee on their adequacy. Logical arguments might include reference to generally accepted practices as an authoritative source and to early discussion and agreement with auditees on their application to auditee operations.

Chapter 2, Part 2, Volume II of this Handbook discusses, in detail, the development of predetermined control models and audit criteria. Auditors are referred to this chapter to gain an appreciation of how the logic inherent in this process might be presented to an auditee to gain agreement.

Gaining Acceptance of Audit Findings: Oral Debriefing

The job of persuading a critical auditee in a debriefing requires an open, rational and logical presentation of facts and opinions. An orderly and complete presentation will allow the auditee to scrutinize the logic and assess the validity of the auditor's statements. It should be remembered that the purpose of the exit interview is to provide an opportunity for the auditor to test conclusions and for the auditee to comment, raise questions and voice concerns prior to issuing the written report.

The auditor must make clear the objectives of the communication - what is to be demonstrated. This will focus the discussion for the auditee. The auditor must first state what has been assumed or what has been the starting point.

The audit scope should be stated as well as any limitations or exclusions which would place conditions on that scope. The procedures and methodology used by the auditor to analyze and reason through the data collected should be stated, followed by a description of the findings, conclusions and their significance.

Although there should be no doubt about the facts accumulated, and working papers should support them, auditors should be open about possible weaknesses in their ideas and opinions (e.g. such as being tentative or even faulty, as well as the reasons for this), and should acknowledge difficulties or constraints experienced during the audit. It is not unusual for an auditor to couch certain findings in terms of

limitations such as unavailability of resources or time to pursue an issue in greater depth, particularly issues of intermediate materiality. For example, in a case where a judgmental sample has been used, the auditor would only be able to comment on the sample and not the whole population.

The auditor must be receptive to critique by the auditee and be prepared to deal with challenges to statements made. Testing of the auditor's ideas in this manner will ensure that the auditee is able to voice concerns. In fact, the auditor should solicit criticism in the interests of the best thinking, and to avoid the possible impression that matters are being concealed.

Based on auditee feedback, the auditor may need to rethink ideas or opinions and perhaps change others. If the interchange between auditor and auditee is cooperative and participative, the prospects of gaining agreement will be brighter.

The other aspect of gaining agreement, that is the psychological or human aspect, is more concerned with the impact of the auditor's message on the auditee. Aside from delivering a logical message, the auditor must be capable of controlling the reaction to the message so that the auditee is willing to listen and accept ideas.

Two approaches for gaining agreement are 1) moving from the familiar to the unfamiliar, and 2) moving from the acceptable to the initially unacceptable. In these approaches, the auditor begins with information or ideas the auditee feels comfortable with and builds an understanding of new ideas, suggestions or recommendations the auditee may be hesitant about or opposed to. The auditor should of course, use facts to convince the auditee, but examples, comparisons, and analogies can assist in the development of ideas and lend more credibility and persuasive power. Where disagreements are irreconcilable, the auditor should state that the facts must be reported as seen by the auditor, but that the views or opinions of the auditee will be included in the report.

In some situations, the exit interview may be supplemented with a visual presentation utilizing flip charts or slides. Such a technique is suitable when a group of interested departmental officials is to be debriefed or when special emphasis is desired.

The auditor's goal, in the end, is to move the auditee from belief to action. Without this outcome, gaining agreement becomes academic. If the auditee is ready, action may be induced through a subtle or direct challenge. More often a plan of action is solicited whereby the auditee can spell out what will be done to correct problems.

Report Writing

Report writing merits special treatment since it is this medium on which the auditors depend to communicate formally the results of their work and represents the evidence of their analysis. The report is the tool used to inform, persuade and advise others on ways to improve and provides a record for follow-up.

Auditors write audit reports to win agreement and effect change. Therefore not only is it important to express ideas clearly and accurately, but the auditor must find the right approach to report writing - that is, one which is suited to the particular reader or readers.

Clarity and Precision

The clear and precise expression of ideas begins with an understanding of the purpose of an audit report which must be clearly defined at the outset. The auditor must weigh the need to which the report should be "selling" proposals against the extent to which such proposals have already been sold. The nature of recommendations must be considered and whether special emphasis (graphs, charts, etc.) should be added to clarify or explain them.

To assist the auditor in deciding on the arrangement of the report, consideration of who will use the report and how it will be used is essential. In the federal government, report recipients can cover several echelons. For example, the auditee will always receive the report, and it is normally at this level that corrective action is initiated. However, the auditee's superiors will also be interested in the results of an audit as one means of keeping apprised of the auditee's performance. Managers responsible for policy that the auditee might be expected to implement will also be interested in audit findings, particularly where these point to policy as a problem

area. These managers may be superiors of the auditee, program policy advisers or functional managers, (e.g. finance, personnel).

Once the auditor has clarified these issues, the structure and style of the report can be determined.

Report Structure

Report structure can vary from audit to audit, and there is an abundance of literature on the topic. Rather than prescribe any particular style, this section will focus on general principles which should be observed in writing audit reports.

Audit reports should describe the area audited, the scope of audit activities, the work which was performed, an analysis of the state of the area audited, a list of findings or areas for improvement, (including cause and effect/impact analysis), audit conclusions along with their rationale and audit recommendations. The addition of an executive summary will often prove helpful to readers who are farther removed from auditee operations but nonetheless have an interest in the report. Appendix 1 illustrates a recommended outline for an audit report.

Because the success of an audit report depends on its credibility, it is critical that findings are substantiated by factual evidence. Even one unfounded statement in a report can destroy its credibility and jeopardize good rapport with the auditee. Therefore the auditor should ensure that source data are double checked and that there is careful analysis and scrutiny of audit findings so that conclusions cannot be diminished.

Scrutiny of an audit report should occur as part of the quality control function in an internal audit organization. Quality control would typically involve a critical review of the report contents including language, tone, logic and length. This review will cover an examination of language for completeness, conciseness, appropriateness and accuracy. Words must be chosen carefully to get the reader to read, understand and act on an audit report. Tone must be carefully considered so that the report does not appear overly critical or fault-finding, but rather leaves the reader with a more accurate impression of the state of the auditee operation.

Much of the persuasive impact of a report is accomplished through logic. The auditor must reflect a clear-thinking approach to the justification and promotion of proposals made. But despite the adequacy of language and logic, the length of a report may deter the auditee from a careful review. There is no ideal length for an audit report, but it should be short enough to maintain the reader's interest, yet complete enough to cover all relevant information. Mechanical faults such as poor spelling, incorrect syntax and messy appearance must be completely eliminated from the report so as not to diminish its value.

Depending on the nature of the audit, the auditor may be faced with the complexities of multi-level reporting and how best to present findings under such circumstances. In an organizational audit of an administration unit for example, the auditor will be reporting on all responsibility centres within that unit. These would typically include personnel, finance, communications, etc. There is no standard or universal model for audit reporting in these situations, but there are preferred options.

One option is to report by letter or memo to all responsibility centre managers outlining specific findings pertaining to their individual areas of activity. The letter may or may not be accompanied by the formal report, as deemed appropriate. Advantages of the letter or memo include its ability to add a personal touch, to acknowledge special courtesies which may have been extended and to focus findings to the specific recipient. Brevity is recommended and the letter should not normally exceed two pages. These letters can be adjoined to the formal report for the primary recipient's information.

Alternatively, the report may be written in sections corresponding to the various responsibility centres, which can be extracted as required, for transmittal to the manager concerned.

The concept of separate letters or memos is applicable for matters of lesser importance that should be put in writing to the auditee but are not of sufficient importance to be included in the report to the deputy head.

An additional report, different in nature from the audit report, yet a vital instrument in informing the deputy head of the progress of the internal audit function is the annual report to the deputy head. The head of internal audit should submit a report, outlining the actual audit coverage as compared to the annual schedule, along with explanations of significant deviations. Major audit findings and recommendations during the year and recurring issues should be summarized as well as the status of corrective actions. The annual report is also an opportunity to raise other matters requiring the attention of the deputy head.

Report Style

Determining an appropriate style for an audit report requires analyzing the environment and personal characteristics of the recipient. The auditor must try to talk in the reader's language and address the report to the reader's interests. Auditees are more knowledgeable and experienced in their field than the auditor is likely to be and the auditor should confine statements to what can be demonstrated through standards, tests and procedures rather than venture opinions which relate to the auditee's professional competence.

Auditors are often at a disadvantage in terms of gaining agreement through a report because the auditee is generally defensive and skeptical before the reading even begins. To counteract this, auditors can influence more effectively by adopting a style of complete reporting. This style promotes balance by acknowledging the achievements of the auditee's organization (e.g. good practices or action already initiated), as well as the shortcomings and gives credit where it is due. Such an approach tends to lower the auditee's resistance to the audit report and increase receptivity to findings and recommendations.

Written communication must be complemented by oral communication in the form of continuous dialogue between auditor and auditee to facilitate acceptance of the report. This contact will alert the auditee to probable recommendations before they appear in print and will reinforce the constructive orientation of the audit.

It is not the role of the auditor to order or demand action, although this can be quickly forgotten by auditors focusing on compliance issues. The emphasis or tone must be on assisting the auditee in attaining operational objectives. Even though the auditees usually have little choice in the matter of whether they will be audited, an audit report must be "marketed" to the auditee to pave the way for change.

SECTION FIVE: COMMUNICATIONS AND THE INTERNAL AUDIT ORGANIZATION

Aside from communications with auditees, there are significant communications impacts within internal audit organizations stemming from heads of internal audit and audit managers which must be recognized and managed. This section examines specific communications aspects at different levels in the internal audit organization and their potential ramifications.

Role of Heads of Internal Audit in Communications

The head of internal audit is a key player in the establishment of an effective internal audit organization. While organizational structures certainly set the foundation for the role of internal audit in a department or agency, the communications ability of the head of internal audit can greatly advance the image of the organization. There are at least four areas of work in which the head of internal audit can be influential in promoting the respect, professionalism and credibility of the internal audit group. These are in managing the organization, in advising the departmental audit committee, in liaising with management, and in liaising with external audit organizations.

Managing the Organization

Successful communication in the management of the audit organization can be difficult to achieve given the general orientation of the audit management team towards upward communication. Auditors may have little contact with the head of internal audit and, as a result, they may not understand the demands placed on that job or on audit managers. Auditors may have unclear ideas about what superiors are actually doing and therefore develop the sense that superiors are more concerned with "politics" and unimportant tasks.

If no action is taken to dispel such misconceptions, informal grapevines can emerge creating rumours and exaggerations. Communications of this nature can be positive in terms of free exchange of ideas and transfer of information, but they can also be destructive to the organization by breeding discontent and morale problems.

Keeping in touch with audit staff formally and informally can alleviate these problems. Practices such as regular staff meetings where audit staff can be exposed to the issues affecting the organization and can express concerns assist communication. To some degree, performance appraisal interviews can assist in providing opportunities for improved communication between supervisors and employees.

Advising the Audit Committee

The audit committee provides the internal audit group with a communication vehicle to the deputy head and can thus increase the status and authority of auditors.

The head of internal audit frequently acts as secretary to this committee and can influence the proceedings by having input to the agenda, organizing material for committee members, formulating lines of enquiry and providing technical assistance. The better the communication skills of the head of internal audit, the more influence he/she is likely to exert. The degree to which the audit committee is able to assist deputy heads in fulfilling their responsibilities for the performance of their organization is largely a function of the quality of audit issues raised and the communication skills of the head of internal audit in clarifying and elaborating on these issues.

Liaising with Auditee Managers

Liaising with auditee managers is an on-going communication activity aimed at keeping abreast of the evolution of auditee organizations, operations and delivery systems.

Liaising with External Audit Organizations

The head of internal audit will, from time to time, become involved in liaison with external auditors such as the Office of the Auditor General, the Public Service Commission or the Commissioner of Official Languages and quasi-audit organizations such as program evaluation, departmental review groups and central agency review groups. The purposes of this contact would typically include resolution of audit issues, coordination to avoid duplication and work-sharing arrangements with the external auditor.

Through skillful communication, the head of internal audit can achieve cost-effective audit effort, smooth working relationships and can make progress towards the resolution of the audit reliance issue. These issues can be delicate since the practice, for example, of placing reliance on the work of internal audit, is not well established and there are no universal guidelines governing the conditions under which internal audit work shall be judged to be reliable.

Role of Audit Managers in Communications

Audit managers normally find themselves in the middle of the communication flow in an internal audit organization. They are the recipients of communication from heads of internal audit on the one hand and from auditors on the other.

Depending on their organizational relationship to the head of internal audit, audit managers may be in frequent contact or may rarely see the head of internal audit. Even if contact is frequent, audit managers may still experience difficulty translating information downward.

Communication skills are a significant factor in the quality of leadership and tutorship audit managers provide to their auditors. Key ingredients in the success formula of an audit group are motivation, team spirit and commitment. Building these attributes is central to improving productivity. Audit managers can achieve these objectives by being straightforward and open with auditors. Employing communications techniques which make auditors feel included in decision-making and support auditors' efforts will inspire loyalty and confidence.

Audit managers depend on auditors for the quality of information reflected in an audit report. There is a vested interest in ensuring that communications are adequate to ensure that what is reported is accurate and fair. This becomes all the more important for audit managers who do not spend much time in the field. Coaching to supplement professional practices and to provide constructive criticism can help motivate auditors.

Being accessible to auditors and taking an interest in their career development contributes to an atmosphere of support and encouragement.

CONCLUSION

In the foregoing, an attempt has been made to illustrate the types of communications challenges facing the internal auditor and how the auditor should respond to maximize effectiveness.

Communications requirements were discussed in terms of establishing rapport, eliciting information and gaining agreement. Various techniques for achieving communications objectives were examined, covering both oral and written methods.

Section Five elaborated on the written medium of reports, covering particularly important aspects of report writing such as structure and style and emphasizing the need to gear presentation to the interests of the auditee.

The last section dealt with the communications aspects at work within the internal audit organization and the respective roles of the head of internal audit and audit managers in ensuring effective communications links.

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FORMAT FOR AUDIT REPORTS

1. Covering Letter

- identifies the audit, audit time period and initial distribution of the report.

2. Table of Contents

3. Executive Summary

- where required, summarizes the major observations, conclusions and recommendations for the ease of the deputy head.

4. Scope and Objectives

- contains a description of the audit entity to give the reader insight into the internal and external factors influencing auditee operations;
- outlines audit objectives and scope as well as any limitations on scope to avoid the impression that audit work was conducted where it was not;
- outlines methods and procedures followed in the conduct of the audit;
- acknowledges the assistance provided by the auditee staff.

5. Summary of Observations and Conclusions

- provides a summary of major observations and conclusions as they relate to the audit objectives;

- gives clear explanation of conclusions including the basis on which they were formed;
- outlines any corrective action which has been taken or which may be required on the part of the auditee;
- should not create an overly negative total impression;
- should not exceed two pages.

6. Detailed Audit Observations and Recommendations

- sets out specific observations and make recommendations for corrective action;
- includes comments on the extent and effectiveness of corrective action taken in preceding audits;
- should not include the names of individuals responsible for adverse conditions;
- sets out the problem and provides all facts related to allow the reader to understand the issue, including materiality;
- sets out the causes of the problem, assessment of the risk of the problem and action required, as well as the level of management responsible for corrective action;
- may include details of the audit evidence where such adds to the reader's comprehension of the issue;
- may identify good practices which have application to other areas;
- should include only observations of major concern, (observations of lesser importance may be dealt with orally or through a separate letter).

7. List of Recommendations

- recapitulates recommendations made with references to appropriate pages in the report;
- should provide space for the auditee's response and target date for completion.

8. Appendices

- may contain charts, tables, graphs, etc., to support the text of the report;
- provides explanatory but expendable information.

CHAPTER NINE

AUDITOR RELIANCE

INTRODUCTION

The purpose of this chapter is to sensitize the internal auditor to the issues relating to the concept of reliance, the various conditions under which reliance can occur and the general criteria that might apply and the special conditions that auditors should be aware of in the various reliance situations.

At this point in time, criteria for reliance are quite general, thus necessitating considerable judgment by the auditor in the determination of the degree of reliance and subsequent reduction in the extent of audit undertaken.

Considerable research is necessary in order to improve the criteria for reliance for the various reliance situations and to validate the reliance process. It is hoped that current research being carried out by the Canadian Comprehensive Audit Foundation and the deliberations of the CICA's Public Sector Accounting and Auditing Committee will contribute guidance that will help to improve current practice.

The presentation in this chapter begins with a discussion of general criteria for reliance (Section One), followed by a discussion of reliance on internal control (Section Two) and ending with a discussion of the conditions of relevance when considering various types of reliance, including reliance on specialists (Section Three), reliance on other reviewers/evaluators (Section Four) and reliance on other auditors (Section Five).

SECTION ONE: GENERAL CRITERIA FOR RELIANCE

What is Reliance?

According to Webster's New World Dictionary, to rely is to trust, depend on, or have confidence in someone or something. Applying the dictionary meaning into the audit context, the auditor will rely on work done by another party if it meets certain criteria.

The purpose of reliance is generally improved efficiency (i.e. lower cost) in completing the audit, however, it may have other benefits as well. For example, it may result in more timely reporting, more complete coverage or new insights. The reliance process may also be used as a means for on-the-job training; for example, in the case of joint audits or the secondment of a member of one audit group to another.

In audit circles the term reliance has been generally applied to the relationship between the external auditor, as the one relying and other external auditors, internal auditors or specialists, as those being relied upon. However, the concepts involved are equally applicable to reliance by internal auditors on the work of others.

The key issue in reliance is that of clear, relevant, meaningful and credible criteria that are sufficiently precise to be objectively measurable and, therefore, not susceptible to judgmental biases or errors. In the past, biases have occurred in both directions; relying where reliance should not have occurred, and the more common situation, that of external auditors not relying when it was feasible and cost effective to do so.

In the following, criteria will be discussed in two stages. First, those criteria which are independent of who is being relied on will be dealt with. This will be followed by a discussion of those criteria that are unique to the party to be relied on.

General Criteria for Reliance

In order to treat criteria for reliance in an orderly way and to provide context for the detailed discussion to follow, it may be useful to begin by relating criteria for reliance to the audit process.¹ Specifically, criteria for reliance will be categorized according to whether they pertain to the examination and assessment of the infrastructure (compliance procedures) or results (substantive procedures) of the party to be relied upon (see Table 1).

The implication here is that the process of deciding on the extent of reliance is like an audit. That is, in deciding on criteria for reliance, the auditor "wears the auditor's hat" and approaches the task in the same way that he/she would approach that same task in any other audit situation.

Keeping in mind the nature of procedure or test the auditor intends to perform, i.e. compliance or substantive, Table 2 provides an elaboration of both internal and external audit general criteria that may be used to determine the degree to which an auditor may rely on an internal and external auditor respectively.

1 For a recent discussion of this approach see Ronald G. Peters, "The External/Internal Auditor Relationship - Part 1," CA Magazine, March 1984.

Table 1

Reliance Determination

| High-level Criteria ² | Internal Audit Process ³ | External Audit Process ^{4,5} |
|-------------------------------------|--|--|
| Objectivity, Competence | Audit of Infrastructure (Delivery Systems) | Compliance Procedures |
| Results | Audit of Results | Substantive Procedures |

2 CICA Handbook, Auditing Recommendations, 5215.16, Canadian Institute of Chartered Accountants, Toronto.

3 Internal Audit Handbook, Volume II, Part 2, Chapter 1, "Internal Audit Approaches".

4 *CICA Handbook, Auditing Recommendations, 5215.15.

5 *Internal Audit Handbook, Volume II, Part 2, Chapter 5, "Audit Evidence".

*(The Internal Audit Handbook employs similar terminology but in different context, given the differences between financial attest and internal auditing.)

Table 2

General Reliance Criteria

| High-level Criteria (External Audit) ⁶ | Detailed Criteria (External Audit) ⁶ | Detailed Criteria (Internal Audit) |
|--|---|---|
| Objectivity | Reporting level (reporting administratively) Reporting level (reporting results) | Organizational reporting relationship Audit policy Audit committee Training Supervision |
| Competence | Experience Qualifications Hiring, training, supervision practices | Audit policy and plans Knowledge and experience Training and supervision Audit process, methods and techniques Use of specialists |
| Results | Nature of recommendations | Nature of findings Adequacy of evidence Adequacy of cause- effect analysis Adequacy of recommendations Adequacy of auditee's response and action plan Adequacy of plan implementation |

6 CICA Handbook, Auditing Recommendations, Section 5215.

The criteria for reliance on internal audit are taken largely from the Performance Assurance Review (PAR) Guide⁷. A more complete list is provided in Appendix A. The source of the external audit criteria is the CICA Handbook, Section 5215. More detailed criteria for reliance of external on internal auditors are suggested in articles by Peters⁸ and Spronck⁹ (please refer to the Bibliography).

It will be readily seen from the criteria lists in Table 2 that there is still considerable leeway for the use of judgment in deciding on the degree to which the actual state or performance of the party being assessed for potential reliance satisfies the respective criteria.

Implicit in the assessment process is the assumption that the detailed criteria used will be very much dependent on the nature and purpose of the desired reliance, and that the explicit criteria are augmented by the professional qualifications and requirements of the assessor. For example, when an external auditor is assessing the competence of another external auditor, the degree of conformance to criteria would tend to correlate strongly with the degree to which the characteristics (e.g. educational background) of the party being assessed resembles that of the assessor.

In the case of financial auditing, given the structure of public accounting in Canada, the norm would generally be the CA, however, in the case of comprehensive auditing and special examinations the situation is less clear.

In the next four sections these aspects of reliance will be explored.

7 A guide developed for internal use by the Office of the Comptroller General, Policy Development Branch, Internal Audit and Special Studies Division (based on the Standards for Internal Audit in the Government of Canada, Treasury Board of Canada (Comptroller General) 1982).

8 Ibid (see footnote 1).

9 Managing Coordinated External and Internal Audits, Chapter 5, Lambert H. Spronck, John Wiley & Sons, 1983.

SECTION TWO: RELIANCE ON INTERNAL CONTROL AND INTERNAL AUDIT

Reliance by the External Auditor

The literature on reliance of external auditors on internal control (including internal audit) is extensive,^{10, 11} and will not be repeated here. However, there are aspects of this form of reliance which bear further discussion. These are (1) the degree of reliance that actually takes place, (2) the usual criteria actually used to decide on degree of reliance on internal audit, and (3) the issue of reliance in the case of external audits which are not attestations of financial statements.

Degree of Actual Reliance

In the past there has been general agreement among external auditors that examination of internal controls, in order to help determine the extent of testing, is a good thing. The idea of reliance has an obvious attraction from the point of view of audit efficiency. There is, however, less general agreement as to how much the results of internal control review should influence the auditor's decision on extent of testing. In terms of criteria, this is the weakest link in the chain.

In a recent survey (experiment)¹² aimed at determining agreement among auditors on (1) judgments concerning the reliability of an internal control system and (2) resulting decisions on the extent of substantive testing (sample size), it was found that although there was a high correlation on the first point, there was not the same degree of agreement on the second, i.e. the selection of sample sizes. Generally it was found that auditors tended to choose about the same size of sample regardless of how reliable they judged the internal control system to be.

10 CICA Handbook, Canadian Institute of Chartered Accountants.

11 Tabor, Richard H., "Internal Control Evaluations and Audit Program Revisions: Some Additional Evidence," Journal of Accounting Research, Volume 21, No. 1, Spring 1983, U.S.A.

12 Ibid (see 11).

Aside from being a reflection, to some degree, of the inherently conservative nature of auditors, this survey result indicates that more research is needed in this area. This issue is, of course, considerably complicated in the case of comprehensive/value-for-money/broad-scoped auditing, where the internal controls of interest include a much wider range of controls than in the case of a financial attest audit, where interest is focused primarily on financial controls.

The Usual Criteria Used to Decide on Degree of Reliance on Internal Audit

Consistent with the general case of internal control, there is much more agreement regarding reliance "on paper" than there is in practice. On paper, there is most agreement at the relatively abstract level of "competence, objectivity and results" as being good criteria for judging reliance. The difficulty is that these criteria are too vague and subjective. A recent article in the *Internal Auditor*¹³, in referring to the Statement on Internal Auditing Standards No. 9 (SAS No. 9), issued by the American Institute of Certified Public Accountants (AICPA), said "SAS No. 9 sets general standards for reliance on internal auditors. I use the term general because the standards are broad-based, open-ended, and vague at times. ...the generality of these terms has made effective reliance assessments difficult." The above comments are equally applicable to the criteria provided in the CICA Handbook, although the Handbook does provide a more detailed level of breakout (see Table 2).

The survey described in the above-mentioned article and its companion from the *Journal of Accounting Research*¹⁴ indicated that the two criteria that auditors agree on most are "independence" and "previous year's audit work".

13 Brown, Paul R., "New Evidence on the Reliance Judgment," The Internal Auditor, October 1984.

14 Brown, Paul R., "Independent Auditor Judgment in the Evaluation of Internal Audit Functions," Journal of Accounting Research, Vol. 21, No. 2, Autumn 1983.

Here again, experimental results point to the need for more research. As in the case of reliance on internal control, there is insufficient reliable data on the correlation between reliance criteria being met and actual reliability of results (produced by internal controls or the internal audit function respectively). If one could establish a high degree of correlation between specific characteristics of internal control (or internal audit) and reliability of their respective output (results) there would be much more inclination by auditors to carry that knowledge forward into "extent of testing" decisions.

Reliance in the Case of Broad-scoped Auditing

The issue of criteria for reliance becomes considerably more complicated in the case of broad-scoped auditing simply because the scope of the auditor's activity goes, typically, beyond financial matters and is carried on in non-financial areas of the audited organization.

In this situation, even the rule-of-thumb of using the skill set of a typical external audit team as a model for evaluating "competence" becomes problematic since there is little agreement on what skills, beyond the traditional audit skills, are needed to carry out such an audit assignment. Opinions vary between "this is an audit like any other audit", at one extreme, to "an accountant is not competent to carry out a non-financial audit" (e.g. personnel audit) at the other.

The answer seems to lie somewhere in between. Clearly, to carry out an audit takes audit skills. The issue is whether broad-scoped auditing requires only an augmentation of subject matter expertise (a reliance issue in its own right -which will be dealt with in Section Three) or an extension of the range of basic auditing skills, which equip the auditor or audit team with the ability to examine and assess non-financial as well as financial operations. As discussed elsewhere in this Handbook, it appears that both are required.

In the short term there is no generally accepted solution to this problem aside from the use of judgment, supplemented by the guidance provided herein. In the longer term, some help may be on the way with at least two professional bodies taking initiatives which could throw light on the subject. These bodies are the Canadian

Institute of Chartered Accountants', Public Sector Accounting and Auditing Committee, which intends to deal with the general subject of comprehensive auditing; and the Canadian Comprehensive Auditing Foundation, which is also carrying out relevant research in this area.

Reliance by the Internal Auditor

Given the purpose, scope and specific objectives of internal auditing, reliance on internal control is as simple, or as difficult, as the internal audit process itself. This is because, unlike external audit, examination and assessment of internal control is the main thrust of internal auditing, rather than simply a means of reducing the extent of substantive testing to be performed.

This does not make the job any easier for internal auditors than for external auditors, but internal auditors do not have the option of not relying. At the minimum a control not relied upon would have to be documented, reported upon and substantiated, in terms of the impact on organizational operations of its lack.

Since, as already noted above, reliance on internal controls is the heart of internal auditing, the process of direct reliance is covered by other chapters in Volume II, Part 2 of this Handbook and will not be dealt with here. Reliance on indirect internal controls, such as monitoring, inspection, quality assurance, program evaluation and similar functions will be discussed in Section Four.

SECTION THREE: RELIANCE ON SPECIALISTS

There are basically two ways in which specialists may be assigned to an audit team. One is as an auditor with at least dual expertise, that is, the usual audit background plus an added skill, say EDP; the other way is as a specialist, for example a statistician.

In the first case there is no reliance problem since the auditor with additional specialization easily meets the minimum requirements of the ideal model. Any minor variations in performance would be dealt with as a normal part of the audit supervision process. The second case is what is normally referred to as "reliance on a specialist".

In Section 5360 of the CICA Handbook¹⁵ there are several examples of situations where specialists might be used. This list is equally applicable to internal auditing, however, it would need to be considerably augmented to reflect the broad-scoped auditing situation. In attest auditing, the use of specialists is an exception, while in broad-scoped auditing, an audit not requiring the use of specialist skills would be the exception.

The CICA Handbook also provides factors that will influence the auditor's decision as to the extent of his/her procedures as follows:

- the materiality of, and the risk of significant error in, the item being examined in relation to the financial statements as a whole;
- the complexity of the item; and
- the absence or nature of other source of audit evidence available with respect to the item.

¹⁵ Canadian Institute of Chartered Accountants.

In addition, the three general criteria mentioned earlier - competence, objectivity and results - are also relevant, although in a narrower sense, commensurate with the scope of the specialist's involvement.

In the case of "results" or output, although relevant criteria may exist, their direct verification by the auditor may be problematic, as the auditor may not have the technical background to judge conformance (e.g. judging the quality of output of a statistician, econometrician, industrial engineer, geologist). The more usual approach to judging achievement of results is to do it indirectly through inquiry as to reputation. This effectively combines the results criteria with that of "competence". Auditing recommendation .09, in Section 5360 of the CICA Handbook, employs the following wording to cover these two criteria:

- .09 When the auditor plans to use the work of a specialist as audit evidence, he/she should have or obtain reasonable assurance concerning the specialist's reputation for competence.

The "objectivity" criteria is somewhat more complicated to apply. It depends on both the nature and scope of input expected and on the allegiance of the specialist. The key distinction that must be made as to scope is whether or not the specialist will participate in the evaluation phase of the audit. If yes, then the issue of objectivity becomes a considerably more important criteria.

As implied above, there are two broad categories of employment possible for specialists. The first is procedural and therefore less sensitive. This would include:

- advice to the auditor in the assignment planning stage, particularly in the development of lines of inquiry;
- advice to the auditor in developing the pre-determined control model and associated audit programs; and
- advice to the auditor in setting up verification tests.

In the above cases, although objectivity is as important as in all auditing assignments, independence is less of a concern. It must be remembered that the specialist will be working under direction of a senior auditor, as an adviser not as a decision-maker.

Where the specialist is utilized in the evaluation phase, independence becomes crucial as the supervising auditor is, presumably, not in a position to evaluate fully the results on his/her own. In this case, reputation takes on more importance as well. In this respect, dealing with specialists who are "professionals", that is they are subject to professional standards and ethics, is an advantage. The degree of the advantage depends on the credibility or reputation of the profession concerned, the organization for which the specialist works, and that of the individual specialist.

Regarding allegiance of the specialist, the following list ranks some typical possibilities in order of increasing independence:

- auditee staff on temporary assignment to the audit group (i.e. staff seconded from the group being audited);
- specialists* on loan from other groups in the auditee's organization for one assignment (i.e. not from the auditee group being audited);
- specialists* seconded to the audit group for developmental purposes;
- specialists* permanently assigned to the audit group;
- non-professionals on contract;
- professionals on contract.

* As has already been indicated, specialists who are also "professionals" tend to have more credibility, to the degree that their profession has credibility.

SECTION FOUR: RELIANCE ON OTHER REVIEWERS/EVALUATORS

The criteria for reliance, discussed in Sections One, Two and Three, all apply here to some degree, depending on the circumstances. To the degree that management relies on reviewers or evaluators as part of its control framework, they fall into the category of internal control; to the degree that these functions are performed by specialists (e.g. industrial engineers, for quality control; classification experts, for classification audit; economists/social scientists, for program evaluation), the criteria discussed in Section Three apply.

Activities that fall into the "other reviewers/evaluators" category are as follows:

- Monitoring or Review Groups
- Inspection
- Quality Assurance/Control
- Auditors in specialty areas (e.g. classification, staffing, materiel)
- Program Evaluation

Aside from criteria for reliance, of equal concern to the internal auditor are the logistics of reliance. To rely on output from such groups, certain procedural measures need to be taken:

- provision needs to be made (e.g. in audit programs) for utilization of the output from such groups as evidence;
- internal audit resourcing procedures should provide for possible utilization of specialists from such groups in the audit assignment;
- internal audit methodology should incorporate their methods and techniques where relevant and beneficial; and
- internal audit should synchronize its long-term plans with those of review or evaluation groups in order to maximize the potential for relying.

Two of the above mentioned review/evaluation groups are discussed in more detail below; review groups that act as extensions of the internal audit group with varying degrees of functional direction and control and quasi-audit groups, whose history generally precedes that of broad-scoped internal auditing.

Decentralized Review Groups

This is the case of head office auditors relying on decentralized reviewers, (sometimes called auditors). Although similar standards and criteria apply as for the case of internal auditors relying on specialists, there is a further consideration: functional direction.

If an internal audit group is in the position of having to rely regularly on a review group within the same organization (e.g. head office internal audit group relying on a regional review group that reports to the regional manager), then it would be more efficient to "institutionalize" the relationship. That is, the relying group would be well advised to negotiate prior agreement on some or all of the following criteria:

- agree to work to a common mandate (or agree that the subsidiary review group will cover off some pre-determined sub-set of the mandate, including such issues as purpose, scope, frequency and reporting regime);
- agree to work to common standards and ethics;
- agree on the skill (knowledge and experience) requirements of the reviewers;
- agree on methods and techniques;
- agree on integrated, or at least coordinated long-term plans;
- agree on the scope, objectives, lines of inquiry and reporting requirements for review assignments; and, most importantly

- agree on the right of the head office audit group to review the subsidiary group for adherence to the terms and conditions of the reliance agreement, complete with provision for sanctions in the case of non-compliance. The first part of this requirement is inherent in the mandate of the internal audit group, however, the second may not be.

(This review could, of course, be performed by the head office group itself or contracted for; there could also be reliance on the external auditor.)

The above institutionalized criteria or conditions for reliance amount essentially to what is commonly referred to as a "functional" relationship.

Reliance of Internal Auditors on Other Auditors

This is in reference to those cases where there are groups of specialized auditors in an organization (e.g. in personnel: classification, staffing and official languages auditors; EDP auditors that operate outside the internal audit group; contract auditors; security auditors). Although these groups are often termed auditors, they are generally treated as review/monitoring groups by internal auditors.

These cases are problematic from the reliance point of view as, in most cases, they do not meet internal audit independence and competence criteria. On the other hand, these auditors are generally more knowledgeable in the auditees' area and carry out much more detailed audits/reviews than could ever be justified by an internal audit group.

Reliance decisions in these cases would depend on the usual competence/objectivity/results criteria, recognizing the inherent limitations on independence for such groups, as they usually report to the auditee. However, even if full reliance (e.g. on results) is not feasible, it may be beneficial to rely on their documentation and advice at the assignment planning and review stages at the least.

SECTION FIVE: RELIANCE ON OTHER AUDITORS

Reliance of auditors on other auditors is, on the face of it, the easiest case. However, there are several possible complications. For example, auditors have varying degrees of auditing education and/or experience. This is particularly true in the case of broad-scoped auditing. Secondly, internal and external auditors have differing mandates; this limits the degree of reliance to something less than 100 per cent. Thirdly, organizational proximity will have a bearing on reliance decisions.

In the following, various situations where internal auditors might rely on other auditors are examined.

Reliance on External Auditors

In this case the issues of competence and objectivity are usually of minor significance since external auditors tend to be the standard or normative model, at least in the area of financial auditing. However, even in the area of financial auditing there is a considerable difference between performing an attest audit on financial statements and an internal financial audit; the common ground being internal financial control.

When making reliance decisions in the case of broad-scoped audits in non-financial areas, the reliance issue gets considerably more clouded. Here the criteria discussed in previous sections, particularly those of competence and results, need to be applied in the same way that they would be applied by the external auditor when deciding on reliance on internal auditors.

As in all cases where standards and related criteria are an issue, mutually agreed terms and conditions would be a great asset. In this regard, the research being conducted by the Canadian Comprehensive Audit Foundation, on the subject of reliance, should be beneficial.

In any case, heads of internal audit should become familiar with the intentions of external auditors regarding their organizations and make every effort to reflect such activities in their audit plans. In the ideal case, the results of external audits, particularly comprehensive audits, may be relied upon, thus, eliminating the need to audit areas of the audit universe covered by them; and vice-versa, it should be possible to convince the external auditors that they can rely on internal audit work where scope and areas of coverage overlap, thus, eliminating double coverage in those areas.

Reliance of Internal Auditors on Other Internal Auditors

Reliance of internal auditors on other internal auditors is both easier and more difficult than reliance on external auditors.

On the one hand, all internal auditors operate under the same standards (at least theoretically), have similar mandates and scope (usually), and use similar methods and techniques (more or less - this is a question of degree). On the other hand, the internal audit population is much less homogeneous (uniform) as to educational background, ability and experience.

In any case, the standards provide a relatively broad basis for reliance decisions (see Appendix A at the end of this chapter). This Handbook should also be helpful, to the degree that it elaborates on the standards.

The most obvious areas of reliance by internal auditors on other internal auditors are the areas where one organization provides services to another organization. In the federal government a prime example is Supply and Services Canada, which provides a number of services including cheque issue and accounting and purchasing.

In these cases, it is assumed that the internal auditor in the user department or agency would rely on the internal audit of the service supplying department.

Another area of possible reliance is where several departments are obtaining similar services from a common private sector supplier (e.g. computing services vendor). In this case it would be advantageous for the heads of internal audit concerned to get together and either delegate one of the internal audit groups to act on behalf of all, form a joint group for the purpose, or contract with a private sector firm to perform the audit on their joint behalf. A fourth possibility is reliance on an external audit of the service centre, where the scope and results of such an audit cover the internal auditor's concerns.

This, of course, presupposes that provision was made for such an audit in the respective contracts between the vendor of the services and the users.

CONCLUSION

In this chapter, general criteria for reliance were explored, followed by discussions of special considerations associated with various combinations of those doing the relying or being relied upon.

The process of deciding on the degree of reliance is subject to the use of considerable judgment, as criteria developed thus far are lacking in precision and are of undetermined validity. This is evidenced by the fact that although auditors have agreed in the past on the utility of reliance as a concept, they have not agreed on the degree to which reliance should affect the subsequent extent of testing to be performed by the relying auditor.

Given the above caveats, the main benefits of this chapter are likely to be sensitization to the issues, greater awareness of the similarities, differences and special considerations associated with the various reliance situations that an auditor is likely to encounter and a better acquaintance with the genesis and current sources of reliance criteria.

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GUIDE FOR PERFORMANCE ASSURANCE REVIEWS

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- B. Check list for Review of Departmental Internal Audit Policy.
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- G. Worksheet for tracking the Audit Process.
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Appendix B

GUIDE FOR PERFORMANCE ASSURANCE REVIEWS: CRITERIA FOR EVALUATION

At this point in time, our approach to evaluation of an audit function is much like that taken by the Institute of Internal Auditors (IIA). Basically the assumption made by the IIA is that, by-and-large, if the internal audit function conforms to the "Standards for the Professional Practice of Internal Auditing" and the auditors performing the audits abide by the "Code of Ethics", the function can be judged as satisfactory. The Office of the Auditor General is taking essentially the same approach as well.

We are currently experimenting with additional tools and techniques in order to give the review more breadth and depth, however, these tools and techniques have yet to be proven.

The following general criteria are being applied in using the methods, tools and techniques as outlined in the previous section:

- (a) In assessing conformance to standards, three levels of evaluation are used:
 - 1. Existence of the required structure, process or behaviour;
 - 2. Enumeration of the required elements of the required structure, process or behaviour; and
 - 3. Overall judgment of the adequacy of the required structure, process or behaviour.

This is supplemented by specific evaluation guidelines published by Central Agencies as follows:

- "Staffing Audit and Review Guide", PSC, April/80;
- "Audit questions on Administrative Policies", TBC, 1980;

- "Audit Guide on Official Languages", TBC, 1979.

(b) A similar approach is taken to assessing the "Management of the Function", supplemented by:

1. General management guidelines as reflected in various OCG and Treasury Board Canada Circulars, Guidelines, etc.;
2. Literature of Management regarding what constitutes good management practice;
3. Work sheet for tracking the Audit process (see Appendix G - criteria self-explanatory); and
4. Work sheet for longitudinal analysis of audit results (see Appendix H).

(c) The Institute of Internal Auditors' Standards and Code of Ethics are used as reference, as is the Framework for Evaluating an Internal Audit Function, developed by the Foundation for Auditability Research and Education and based on the IIA Standards.

